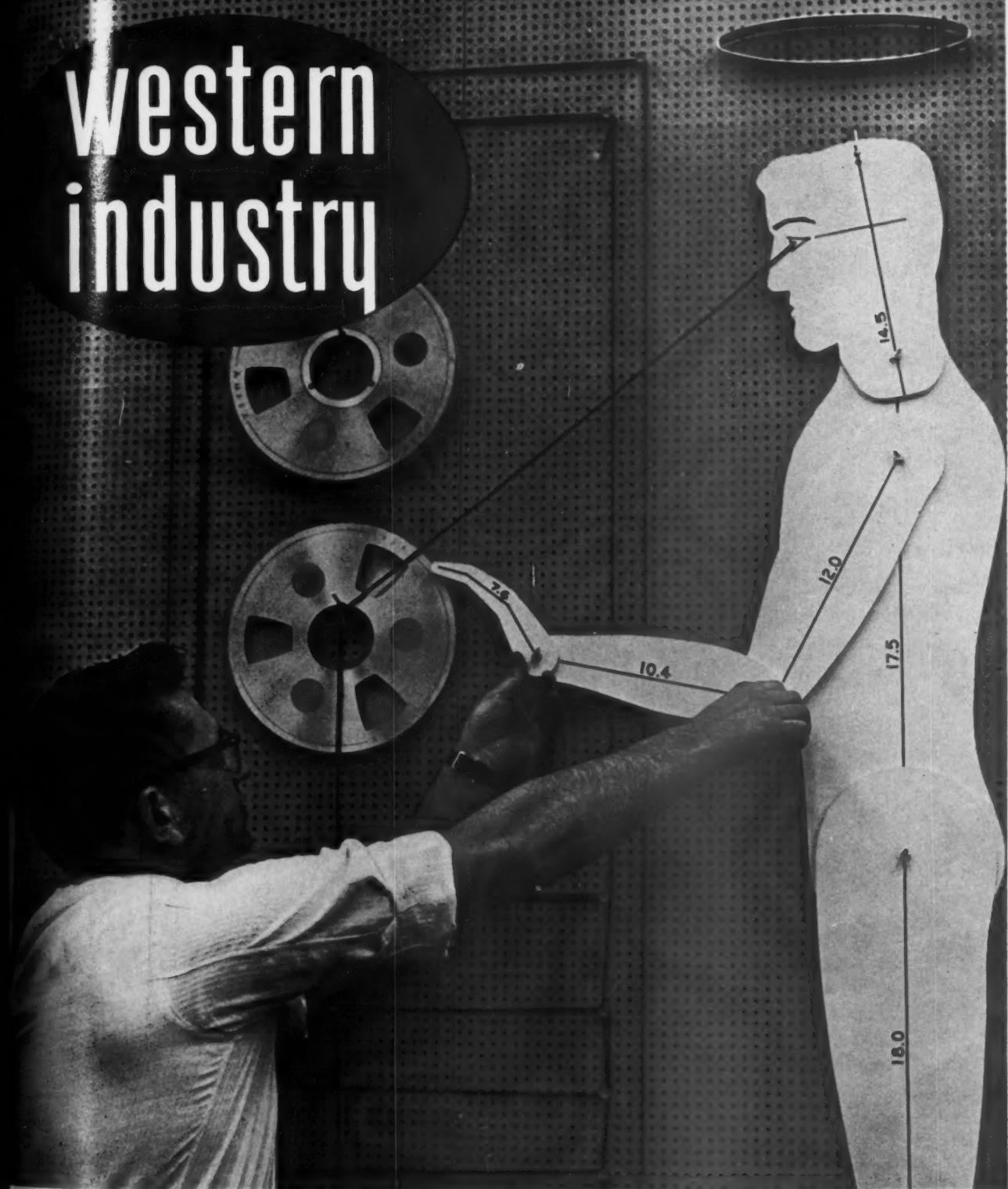


western industry



Computer design checked for ease of operation at Ampex. See page 23.



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LITERATURE ON DRIVE BELTS

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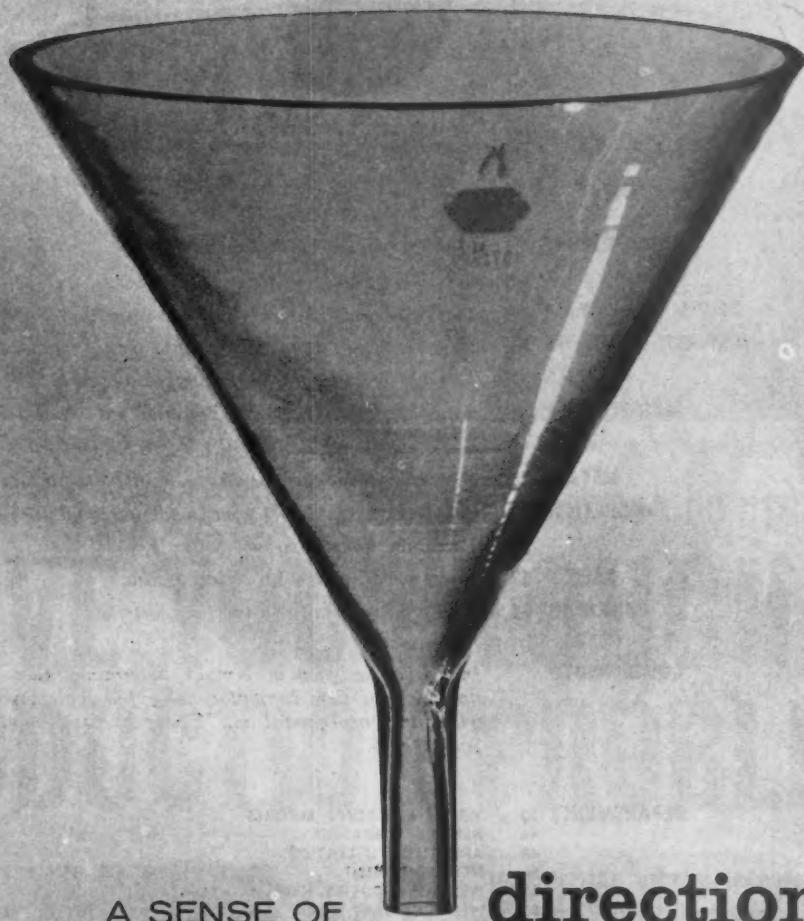
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COVER PHOTO

Industrial designer at Ampex determines ease of operation of new computer using full scale layout with yarn on pegboard and "Elmer Average" model. See page 23.

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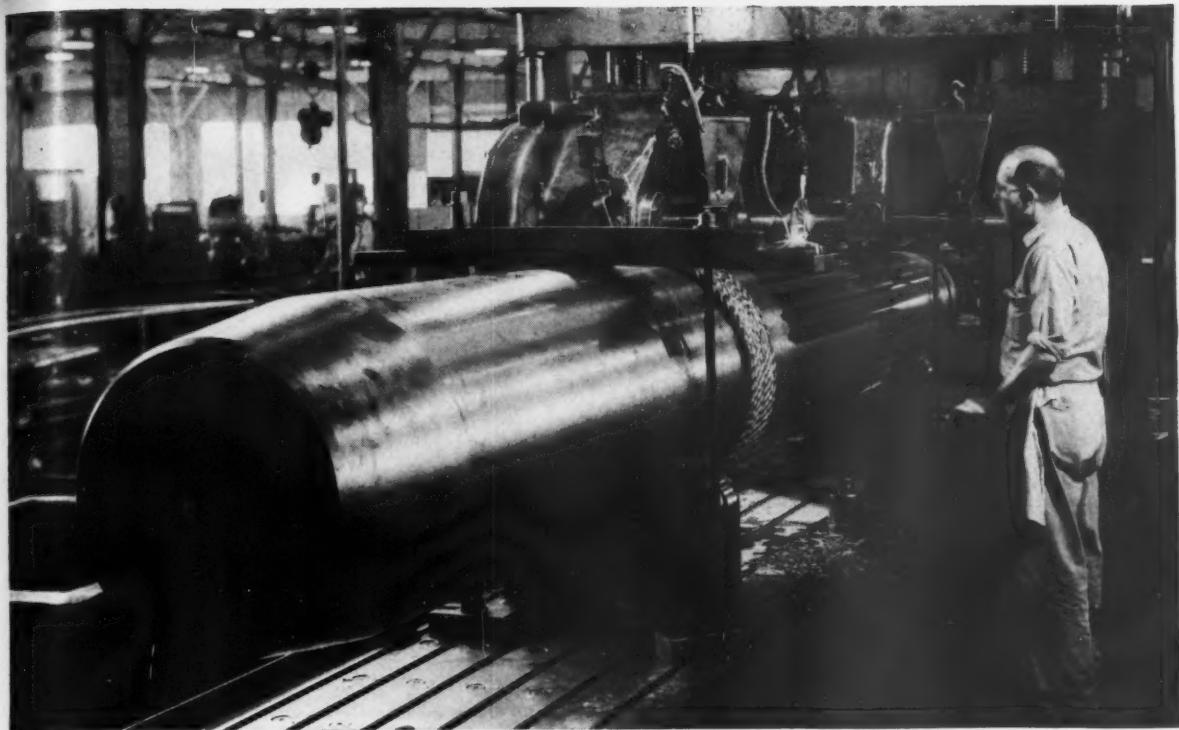
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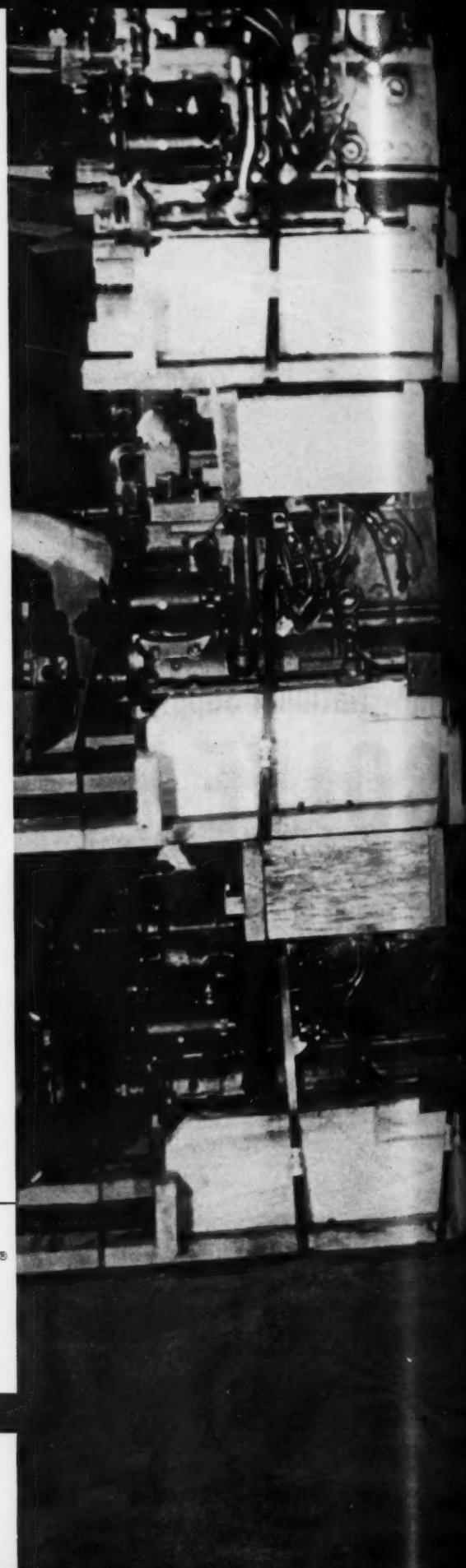
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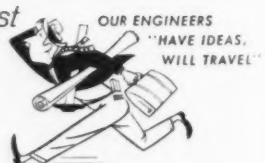
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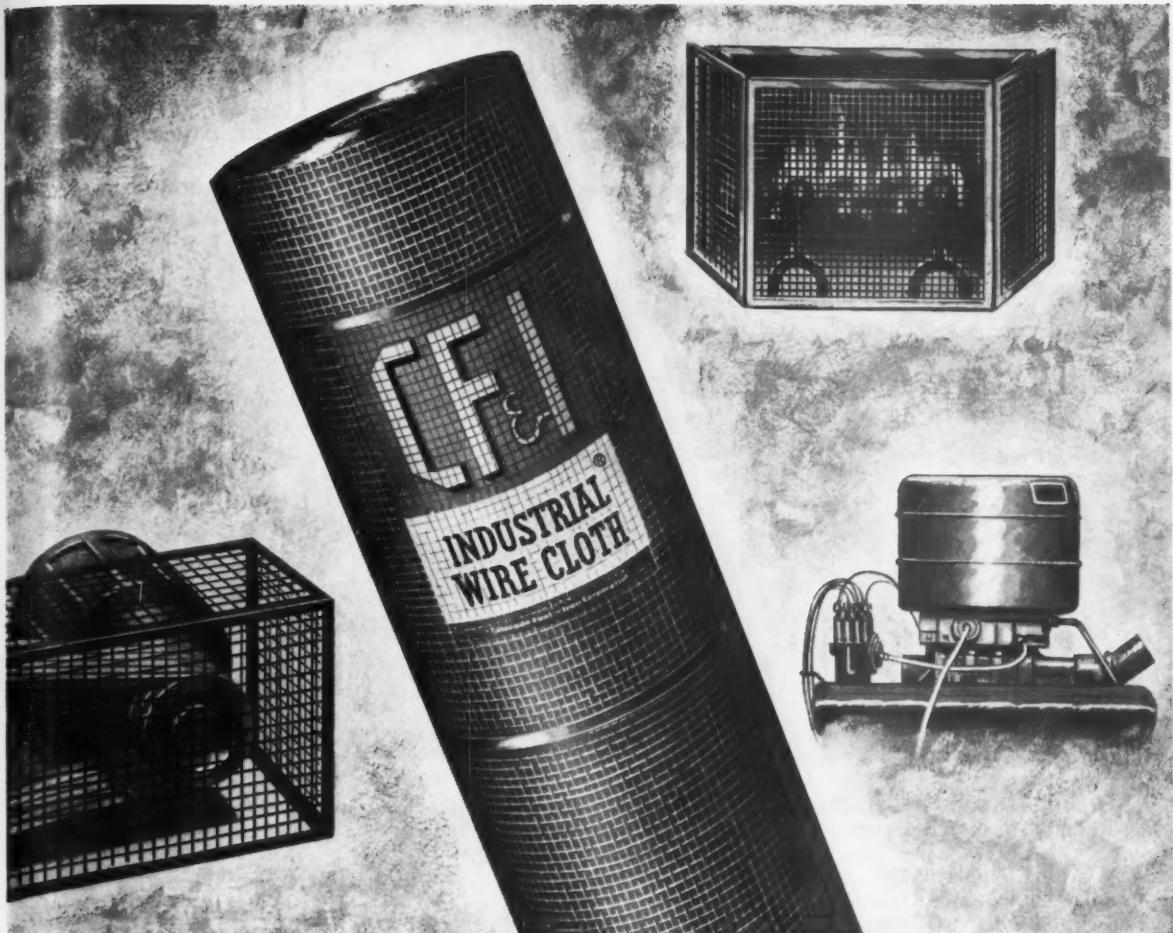
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WESTERN INDUSTRY/MAY 1960



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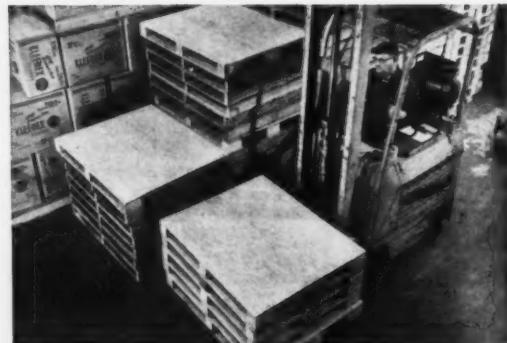
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A REPORT TO MANAGEMENT ON HOW

Industry cuts costs with FIR PLYWOOD



Fir plywood building components cut costs and speeded construction of this 50,000-sq.-ft. International Paper Co. plant, Auburndale, Fla. Giant plywood box girders support stressed skin roof panels, which incorporate ceiling, framing and roof decking. Panels are paired to form a peaked roof over each 40' bay, providing large clear floor areas. Exterior walls are overlaid fir plywood, which needs no finish and virtually no maintenance. Construction with light, strong, prefabricated plywood components kept over-all costs to \$7.54 psf. The entire structure was completed in only 154 working days.



Switch to plywood from lumber for pallets at West Coast Grocery Co., Tacoma, Wash., has greatly reduced repair and replacement costs. Plywood is smooth, split-proof, splinter-free; nails can't work loose. Easily damaged merchandise gets maximum protection.

Plywood ducts exposed to corrosive chemical wastes at this cellophane plant have required no maintenance in over four years. Exhaust manifolds remove air laden with sulfuric acid mist, hydrogen sulfide, other chemicals and water vapor. Plywood used is high density type, which has a smooth, hard surface, requires no paint or other protection, and is virtually impervious to moisture and most acids and other chemicals.

FOR MORE INFORMATION about fir plywood—its uses, properties and advantages—write
DOUGLAS FIR PLYWOOD ASSOCIATION
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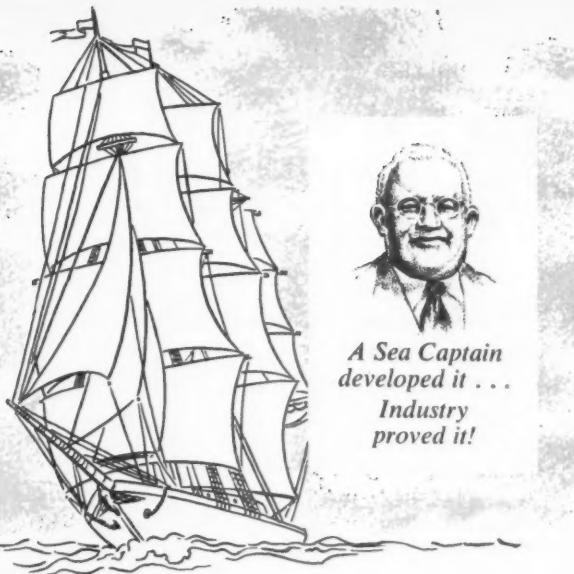
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WESTERN INDUSTRY/MAY 1960



Why Rust-Oleum is different-

and what this difference,
backed by 35 years of industry proof,
means to you!



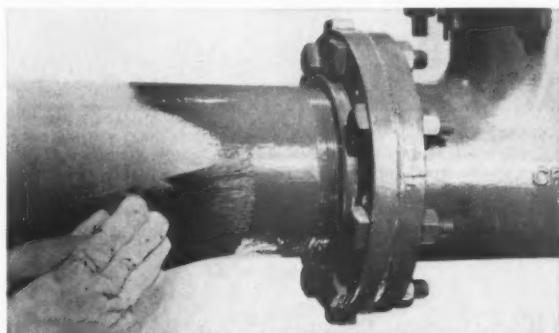
The original Rust-Oleum formula was developed nearly fifty years ago by Sea Captain Robert Fergusson, who became intrigued with the rust-stopping qualities of fish oil early in his career. Creating a special treatment for the fish oil, he used the specially-processed fish oil as the vehicle in combination with fine rust-inhibiting pigments. The result? A coating that actually stopped rust when applied directly over sound rusted surfaces, after scraping and wirebrushing to remove rust scale and loose rust. Possible, because the specially-processed fish oil penetrated the rust to bare metal. This was the birth of Rust-Oleum's exclusive 769 Damp-Proof Red Primer.

PROVED THROUGHOUT INDUSTRY FOR OVER 35 YEARS

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The Rust-Oleum New Color Horizons System introduces a new coating concept to industry. It combines four important factors: (1) the ability to stop rust, (2) smart, modern color harmony, (3) the durability to last and last, (4) ease of application that saves time, money, and metal. See how this system can bring lasting beauty to your plant, machinery, equipment, pipes, tanks, structural steel, fences, etc. Write for complete information or contact your nearby Rust-Oleum Industrial Distributor. He maintains complete stocks for prompt service.



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- Results of radioactive tracing study on Rust-Oleum fish oil penetration.

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western meetings

118 Receive Diplomas On Completing Metals Engineering Institute Courses

THE RECENT COMPLETION of four Metals Engineering Institute courses has been announced by Fred K. Landecker, Chairman of MEI Committee of the Los Angeles Chapter of the American Society for Metals. One hundred and eighteen students received training in one or more courses in Elements of Metallurgy, Heat Treatment of Steel, High Temperature Metals, and Stainless Steels.



INSTRUCTORS for the Metals Engineering Institute courses gather with the officers of American Society for Metals and the speaker at the recent graduation exercises. Left to right, Fred Robbins, Bliss and Laughlin Co., the speaker; David Apodaca and Dr. Willis Chandler, instructors; Fred Landecker, Chairman of the MEI Committee of the American Society for Metals; Stanley Pohl and Morris Tiktinsky, instructors; and H. A. Curwen, President of A.S.M.

H. A. Curwen, Chairman of A.S.M., presented the diplomas and congratulated the men and women at graduation exercises held in the Southern California Gas Company auditorium. Fred Robbins, Vice President of Western Operations, Bliss and Laughlin Steel Co., gave the graduation address. He spoke encouragingly to the new graduates and demonstrated by chart projections of population growth, capital expenditures, etc., the tremendous future growth of the metals industry. The need for more classes of this type to train men in the industry was greatly stressed.

The instructor of each class spoke briefly of the scope and response of the class. These instructors were: Dr. Willis Chandler, Rocketdyne Division of North American Aviation, Inc. who taught, *Elements of Metallurgy*; Stanley Pohl of Aerotontronic Systems, Inc. taught *Heat Treatment of Steel*; Davis Apodaca, Autonetics Division of North American Aviation, Inc. taught the class in *Stainless Steels*;

and Morris Tiktinsky, Lockheed Aircraft Corp. covered the subject of *High Temperature Metals*.

Western Packaging & Materials Handling Exposition Will Have Special Clinic

CONSUMING PACKAGING PROBLEMS that might be solved by selection of proper materials and methods will be aired in a special "clinic" concurrent with the 1960 Western Packaging and Materials Handling Exposition at Los Angeles, July 19-21. It is being sponsored by the Western Packaging Association.

William H. Jaenicke, co-chairman of the Exposition's Board of Sponsors and a nationally prominent packaging consultant, said the clinic panel members will help to draw out typical industrial packing problems and then lead in group analyses and suggested solutions. Large numbers of Western owners, plant supervisors, purchasing agents and other top production management will attend the clinic to be held in conjunction with the displays at the Pan Pacific Auditorium.

Jaenicke said the wide packaging experience of clinic panelists should provide "case history" solutions for most problems, "and don't forget, many of the exhibitors will be providing solutions very vividly at the same time."

He indicated many of the expected 10,000 industry leaders will learn from performance demonstrations such as that planned by Kimberly-Clark Corporation, Neenah, Wisconsin. A "laboratory" demonstration of the characteristics of various packing materials will feature a technically-styled drop testing tube, or a shock comparison test. Cushioning materials, in addition, will get performance tests for water resistance, water absorbency and abrasion tests. The Kimberly-Clark "Kimpak" materials will demonstrate their compressability that makes available 80% more space for the product being packed.

Plant operators with special problems need not take these up in the open forum, Jaenicke indicated. Among exhibitors will be packaging, conveyor and other material handling design agents.

They are prepared to recommend existing machinery for either partial packing and handling needs, or in some cases to recommend steps toward the complete engineering for custom applications.

Of particular interest to industry leaders, he said, are two well-established features about the pioneer exhibition: (1) by spending the few hours required to jet-travel to Los Angeles, the manager of any industry in the West can now do his complete packaging and handling homework for the year, and (2) since the show is not for general public, the exhibitor and potential purchaser can meet and talk without interruption by the non-purchaser or the merely curious passerby.

Quality Control Society To Hold National Convention in San Francisco, May 24-26

THE AMERICAN SOCIETY for Quality Control will hold its 1960 National Convention at the Sheraton-Palace Hotel, San Francisco, May 24, 25, 26, 1960.

The program consists of 63 speakers from all over

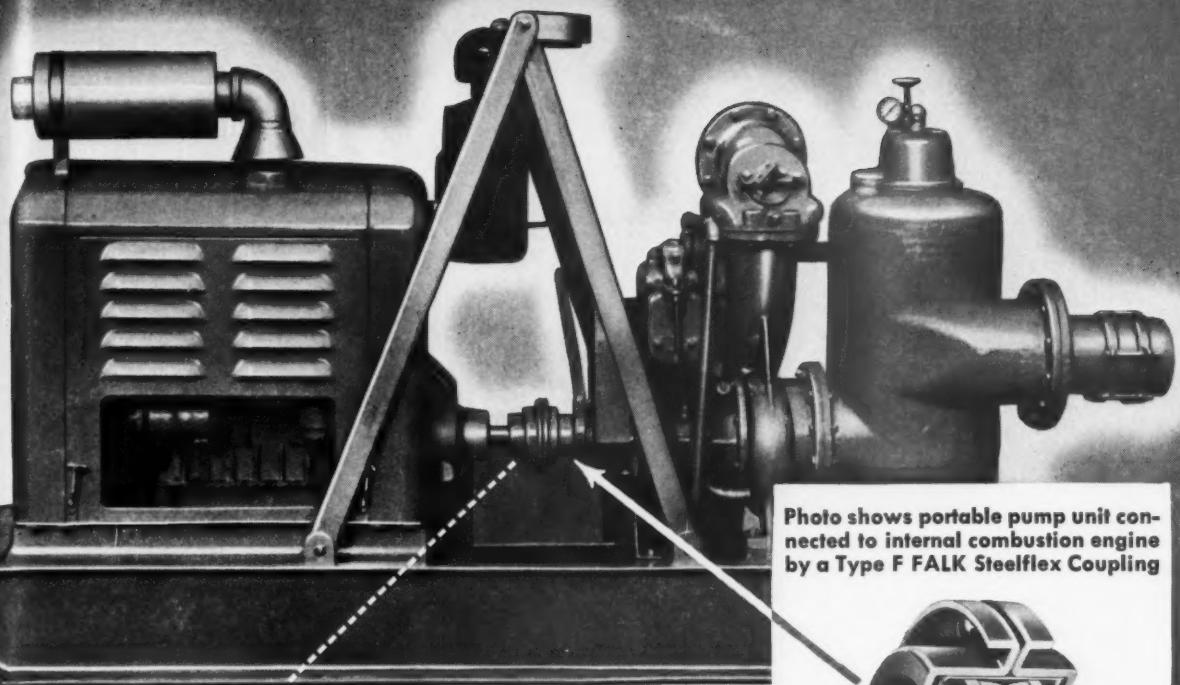
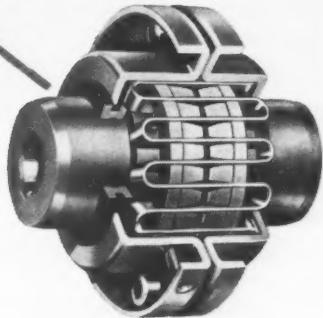


Photo shows portable pump unit connected to internal combustion engine by a Type F FALK Steelflex Coupling



How FALK STEELFLEX Couplings give your connected machinery Double Protection

FIRST: They protect against shaft misalignment. Some degree of shaft misalignment is unavoidable—and unless protective compensation is provided, additional loads are developed on shafts, bearings and other revolving elements. The result is excessive wear-and-tear—and often actual breakage....FALK Steelflex Couplings compensate for either angular or parallel misalignment—or for the more serious condition involving both! The exclusive Steelflex gridmember which joins the two hubs is not fastened to either hub; thus, either hub can shift in any direction without imposing a load on the other hub.

Yet, important as protection against shaft misalignment is to you, it is only one function of the truly flexible FALK Steelflex Coupling.

SECOND: They protect against torque fluctuations which create excess wear on connected machines and frequently induce destructive shaft misalignment. The exclusive FALK Steelflex grid-groove design cushions shock loads, dampens vibration, reduces impact loads as much as 30 per cent. You get this extra margin of protection that can mean the difference between operating and breakdown! You save on maintenance costs. And—you prolong the service life of your machines!...For complete information, ask your FALK Representative or Authorized Distributor. Or—write direct for Bulletin 4100.

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Basic Type F FALK STEELFLEX COUPLING fills the needs of 90% of industrial applications

This cutaway view shows the exclusive Steelflex design which provides torsional resilience with the strength of steel. This torsional resilience spreads peak or shock loads over a relatively long increment of time, thus greatly reducing stresses in connected machinery.

The versatile Type F Steelflex can be used horizontally or vertically, without modification or special parts. It is ideally suited to 9 out of 10 applications. For unusual applications involving overload conditions, extended shafts, brakes, etc., standard designs of dual-purpose Steelflex couplings are available.

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"...our fence definitely discourages pilferage..."

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WESTERN INDUSTRY/MAY 1960

AGAIN-



Shown here is the 6" Reidelator

Reidelator

Dolphin Submersible Pump, one of a complete line of 4" and 6" pumps made by THE TAIT MANUFACTURING COMPANY, Dayton, Ohio. Arrow points to the upper body shell made of Revere seamless leaded brass tubing. Hand holds the diffuser casing made of Revere Brass Strip and used inside pump.

Revere helps "fit the metal to the job"

AND A PUMP MANUFACTURER FABRICATES
SUPERIOR PARTS WITH GREATER EASE... INCREASES TOOL LIFE

An important part of the submersible pumps made by Tait Manufacturing Company is the brass diffuser casing you see above. This part had formerly been made of ferrous metal. While satisfactory as a pump part it was difficult to work and draw... at the same time tool life was short.

One of Revere's Technical Advisors was asked to study the problem. Revere Cartridge Brass Strip of a certain temper was recommended, samples submitted, and, after extensive tests, was approved. The customer has found that not only does the diffuser casing, made of Revere Brass, perform well in the pump, but it also has superior drawing properties, is more easily worked, and tool life has been substantially increased.

This meticulous attention to "fitting the metal to the job" also resulted in Tait Manufacturing Company's specifying Revere seamless leaded brass tubing for the upper body shell of its submersible pumps. Here the application called for extremely close straightness and roundness control which meant special attention to detail on the part of the Revere mills.

Why not put the extensive knowledge of Revere's T.A. Service to work for you? With the wide variety of metals at your disposal, perhaps Revere can help you select the one best suited for the job, with a resultant saving of money while improving product quality.

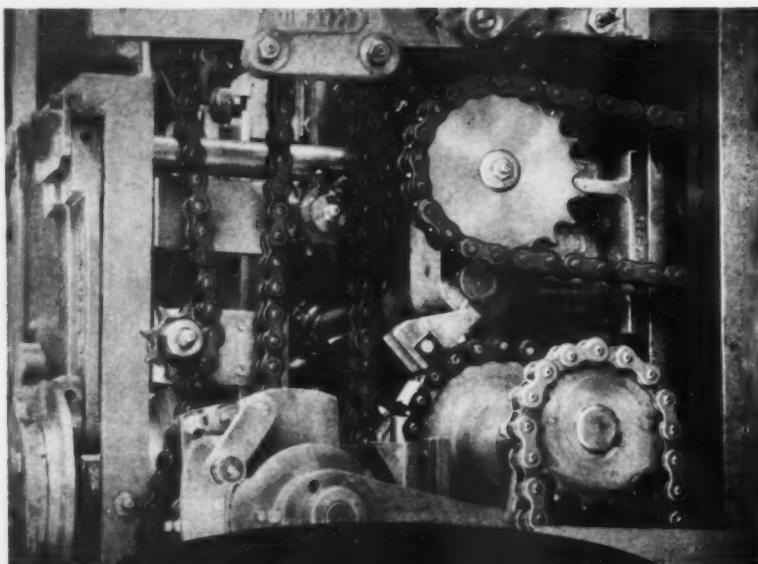


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Let ACME roller chains help you step up production and cut down power transmission cost. Consult your local ACME distributor, he has the full cooperation of ACME's Engineering staff.



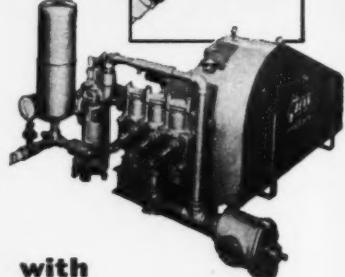
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WESTERN INDUSTRY/MAY 1960

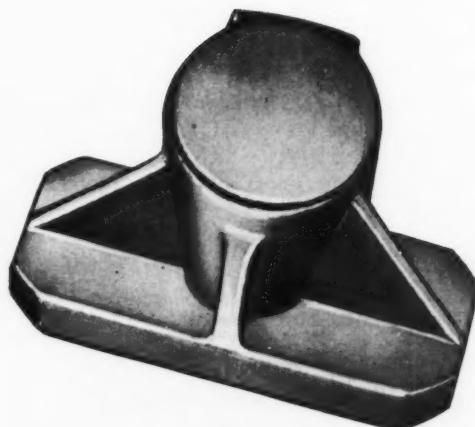
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Write for Bulletin 73W



AMPCO METAL, INC.

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WC-5

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MEETINGS

(continued)

the United States, and in addition to these speakers, there will be an exhibit of an Inspection Workshop for all three days.

The program for the Workshop was arranged by R. C. Haws of Quality Control Engineers, Inc., Los Angeles, California, and will feature:

Ray Primmer of Q.R.A., Inc., Los Angeles, Calif.

Frank Squires, Management Consultant, Los Angeles, Calif.

E. Chandler, Garrett Corp., Los Angeles, Calif.

C. Commefford, P. B. Slatter Co., Los Angeles, Calif.

H. J. Lancaster, B.M.C., Inglewood, Calif.

F. W. Mitchell, Ensign Carborator Co., Fullerton, Calif.

L. Bass, General Electric Co., Jet Engine Division, Cincinnati, Ohio

R. Wylie, Ampex Co., Redwood City, Calif.

J. J. Cusizk, Naval Ammunition Laboratory, Concord, Calif.

H. Karlebach, Omark Industries, Portland, Ore.

Topics to be discussed will include accuracy of measurements, use of optical comparators, gage control and repeatability, training of inspectors and apprentices, industrial and government source inspection, the use of non-destructive techniques and the inspector's place in Quality Control.

Material Handling Chapter Wins Banner



POSING BEHIND A BANNER WON FOR greatest membership increase in Region VII, are new 1960-61 officers and members of the board of the Los Angeles Chapter, American Material Handling Society. Seated left, Wally Brucks, AMHS president, Oscar Mayer Packing Co.; Chuck Shibel, vice president, So. Calif. Gas Co. Standing from left are directors Henry Cooper, Nortronics; Chuck Holmes, Western Air Lines; Tom Brown, Storage Battery Co.; Roland Renaud, Certified Grocers; and Warren Burman, Hyster Co. Annual election of officers was held during a combined meeting of the AMHS San Diego and Los Angeles Chapters, April 14 in Los Angeles.

Structural Steel Group Heralds Repeal Of Building Height Limit

HERALDING THE RECENT REPEAL of the height limit for buildings in Los Angeles, the American Institute of Steel Construction made optimistic forecasts for the



AMERICAN INSTITUTE OF STEEL CONSTRUCTION panelists hold pre-symposium press conference. From left to right, Jack Carlson, Kaiser; Earle V. Grover, Apex; H. Harrison Fuller, Bethlehem; A. J. Paddock, American Bridge Div., USS; Robert S. Grover, Apex.

western structural steel industry that will need to keep pace with "exploding building growth".

This outlook was made last month during the AISC symposium at the Statler-Hilton in Los Angeles where more than 200 western architects, builders, engineers and representatives of the steel industry met to discuss the participation of structural steel in building the megapolis that planners envision extending from Santa Barbara to San Diego by 1980.

Panelists were Earle V. Grover, board chairman, Apex Steel Corp., Los Angeles; A. J. Paddock, president, American Bridge Div., US Steel Corp.; H. Harrison Fuller, vice president, Bethlehem Steel Co., San Francisco; Jack Carlson, vice president, Kaiser Steel, Montebello Fabricating Div.; and Robert S. Grover, Apex Steel Corp.

Following removal of the 13-story height limit in Los Angeles, numerous structures of the "skyscraper" type have been built or are on the drawing boards representing a significant boost in structural tonnages.

Some local structures will go to 22 stories, a record high for the Los Angeles basin. More than a dozen buildings will go up in the next 24 months.

Purchasing Agents Convention in Los Angeles Expected To Draw Over 3000

MORE THAN 3,000 Purchasing Agents are expected to attend the 45th Annual International National Association of Purchasing Agents' Convention and Inform-A-Show, to be held May 22nd through May 25th, 1960, in Los Angeles.

Charles Perkins, Manager of Purchases, Union Oil Company of California, President of the Purchasing Agents' Association of Los Angeles, has announced that the Los Angeles Biltmore Hotel will be the Convention headquarters. Assisting Perkins is General Convention Chairman E. Benton Long, Purchasing Agent for the United States Lime Products Div., The Flintkote Company, and General Program Chairman Victor Quam, Chief Deputy Purchasing Agent for the County of Los Angeles.

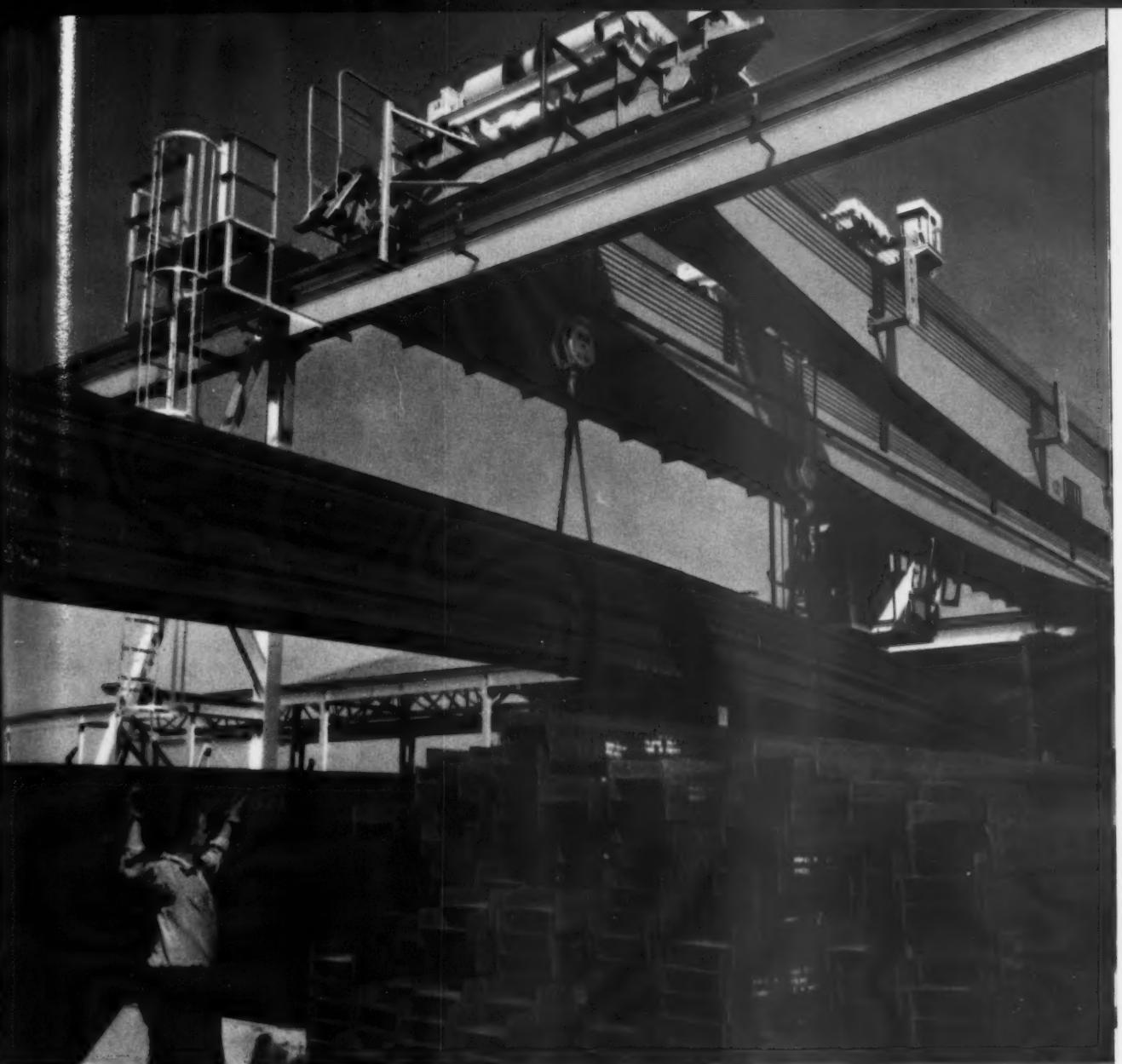


Photo courtesy Pittsburgh-Des Moines Steel Co., Fresno, Calif.

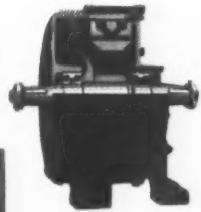
FOR EVERY APPLICATION, THERE'S ONE CRANE OUTSTANDING...

IN STEEL FABRICATING: This double-trolley crane installation is a good example of the way Harnischfeger engineers design a P&H crane for each particular job. With this arrangement, long, awkward beams can be handled quickly, safely . . . without swinging . . . and with accurate control. In addition, the use of two lighter trolleys permits higher travel speeds, thus combining load stability with fast load handling.

Regardless of the material handling problems your plant may have, chances are P&H engineers have successfully solved similar problems. Reason? No other manufacturer has installed as many overhead cranes in as many different applications as Harnischfeger.

If you'd like more information on P&H job-engineered cranes, write for bulletin C-42, Dept. 119, Harnischfeger Corp., Milwaukee 46, Wis.

Cutaway view of P&H electric load brake . . . heart of P&H Magnetorque Control . . . which consists of a simple, indestructible rotor and stationary field through which braking forces are exerted electromagnetically.



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Milwaukee 46, Wisconsin



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Every worker is a wonder-man when it comes to lifting, loading, or transporting shapes in this West Coast steel fabricating plant. That's because a P&H Balanced Design Hevi-Lift hoist provides all the muscle . . . and fine control . . . at any time, in any weather.

Balanced Design means matched components of equal high-strength. There are *no* weak parts in this hoist! It's totally enclosed, weatherproof and dustproof for outdoor use . . . never needs greasing . . . never requires brake adjustment . . . won't heat up even under severe duty cycles.

In short, P&H Balanced Design Hevi-Lifts *will stand up longer under heavier duty cycles — with less maintenance — than any other hoist made today!*

Bulletin H55 tells the whole story. Write Dept. 223, Harnischfeger Corp., Milwaukee 46, Wisconsin.



HARNISCHFEGER
Milwaukee 46, Wisconsin

Photo courtesy Pittsburgh-Des Moines Steel Co., Fresno, Calif.





1960 western packaging exposition

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WESTERN INDUSTRY/MAY 1960

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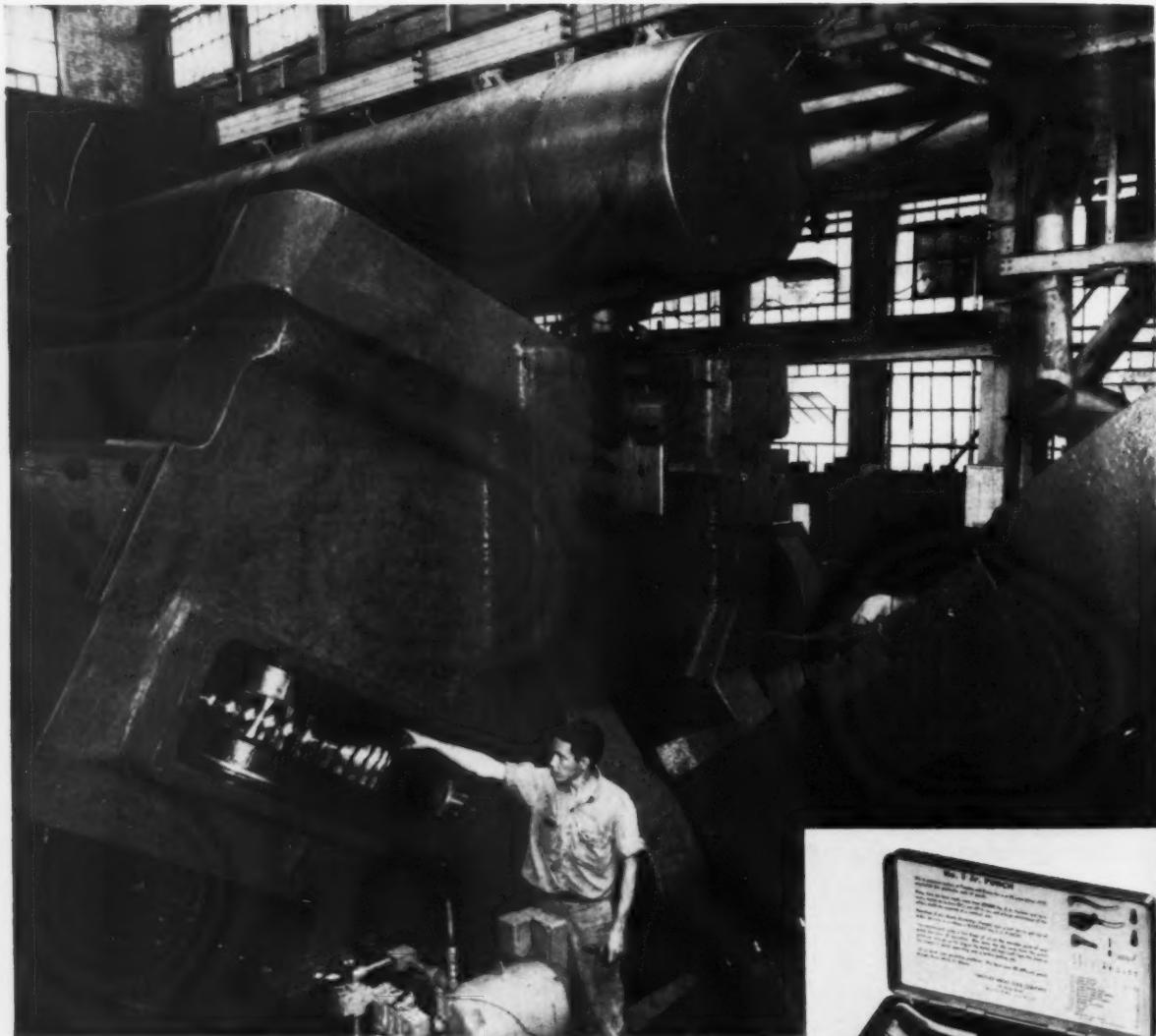
Whatever you need in metalworking machinery Ryerson can supply. Over 3800 types and models are available—everything from this huge bending roll to the little hand punch pictured below.

Ryerson supplies equipment produced by almost a hundred of the nation's top manufacturers—and offers you unbiased recommendations based on the experience of 117 years' service to metal fabricators. In addition, you get a double guarantee of satisfaction

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So next time you are considering the purchase of new equipment, get in touch with the machinery specialist at your nearby Ryerson plant.

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INDUSTRIAL DESIGN key to effective product development

Too often overlooked, good industrial design can aid manufacturing, and provide a better and at the same time more attractive product at lower cost.

INDUSTRIAL FIRMS are becoming increasingly aware of the need for good industrial design in the manufacture of their products. They have come to realize that this is an integral part in the development of a product.

Industrial design is defined as the imaginative development of useful products which are efficient to manufacture and effective in distribution. If applied wisely, it can help overcome competition and provide a profitable existence for a company.

Ampex Corporation, Redwood City, Calif., is a pioneer in the application of industrial design in the electronics industry. At that, the industrial design department in its Data Products Company division is only a little over three years old. Prior to this, however, industrial design of the corporation's products had been accomplished on a consultant basis.

Within the short time since this department has been established the result has been the development of products with more economic manufacturability, improved function, suitability for production of more than one kind, ease of maintenance, safe operation and design for human capabilities.

Industrial designers at Ampex work closely with the company's engineering, marketing, manufacturing and advertising people. The designer thoroughly studies

the product to be made—its use, shape, color, material, relation to the user, potential market and consumer reaction as well as competitive products already on the market.

"Blue-sky" sketches are made first, followed by schematic drawings of the design to prove its practicability and suitability to the over-all design concept. At this state, designers lay out a full-size sketch on a pegboard panel using colored knitting yarn and golf tees. By making a preliminary full-scale layout, they have found that distortion which can occur in a reduced scale layout is prevented. Also, this full-scale sketch affords an opportunity to test the design for human-engineering features. This is accomplished by using "Elmer Average," a specially-constructed full-scale model of the average man.

The full-size sketch is then followed by a quarter-scale model of the design in order to see, handle, and study the product in three dimensions and in use. This quarter-scale model also gives the designers an opportunity to view any desirable interchangeability in design that can be applied to other products. Following management approval, the construction of a full-scale model is begun.

In the design of Ampex Corporation's magnetic-tape-recording systems, where extensive circuitry must

be considered, the industrial designer's model is proving that it can offer many advantages. The costs of constructing a full-scale model are far outweighed by the following.

- 1) *Ideal arrangement of components.* Each engineer has the proper basis for designing his component as a working part of the system. An effective model started at the inception of the product, helps prohibit an unnecessarily awkward and costly package at a later date.
- 2) *Increased safety factor.* Clearances of doors and panels are readily apparent with a design model. Often a mistake that is a "sleeper" on a layout proves a glaring error on the model.
- 3) *Service accessibility.* If a machine is loaded with items that have to be removed for servicing, or if design requires that the machine has to be moved for servicing, it will prove more costly to the owner. With a model these defects are more easily determined.
- 4) *Visual aid.* The model offers the designer an opportunity to try any number of colors, forms, and details to get a realistic estimate of how these will affect the end product.
- 5) *Sales asset.* As the production of the product nears, the model is an aid to sales and advertising, be-

cause it is ready from 3 to 6 months before the prototypes are available.

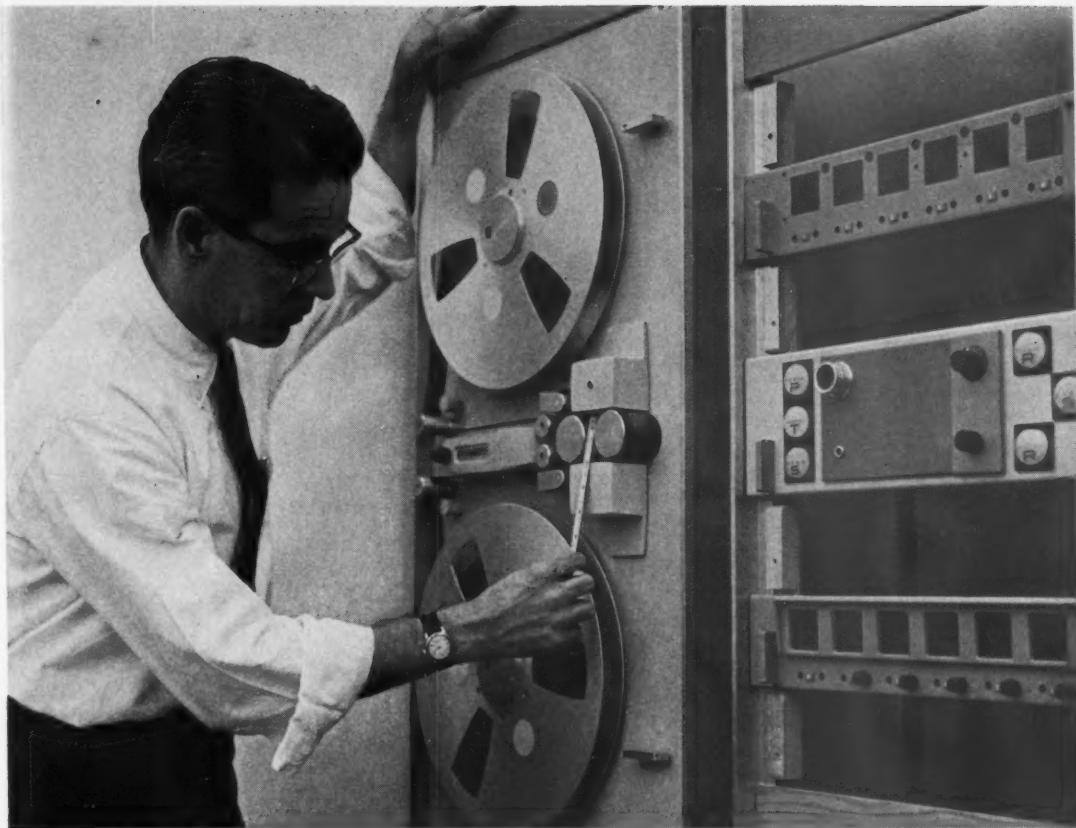
- 6) *Speeds tooling and production.* As a manufacturing guide, the full-scale model illustrates to toolmakers and vendors what is desired. For example, the surface texture of plastic and metal parts, exceedingly difficult to call out on drawings, is easily demonstrated.

Ampex's new scientific data recorder, the FR-600 is an excellent illustration of the substantial expenditures the corporation makes for pre-design studies and models in developing their magnetic-recording equipment. Culminating nearly two years of research and development, it is used for recording vital data necessary for the advancement of our missile and space programs.

Industrial Design, in cooperation with Market Research and Engineering conducted an extensive field survey during the preliminary development stages. In order to establish product specifications, system concepts, industrial design ideas, pricing requirements and prime-cost goals, over 58 prospective customers were contacted. After six weeks, the designers returned to make "blue-sky" sketches of the customers' desires. Following these sketches, a full-size outline, utilizing the knitting-yard-golf-tee technique was made. From



F. ARDEN FAHREY, industrial designer, shows interchangeability of FR-600 system. Tape transport and control sections are mounted side-by-side increasing operator convenience and providing storage space below.



WORKING ON THE FULL SCALE MODEL of the FR-600, Ampex Corporation's highly scientific data recorder. Here the designer is measuring for possible mounting of a cover plate.

the string model, it was apparent that a number of human disadvantages prevailed. "Elmer Average" was forced to assume some most uncomfortable positions to reach the various meters and controls on a control panel only 10 in. from the floor. A first alternative was reversal of the tape transport, but although this improved the control convenience, it increased the manual dexterity required to load reels of tape onto the machine. Industrial Design proposed that the controls and tape transport be placed adjacent to one another at the proper working level. This design also afforded an excellent storage area below the operator level that could be used for such items as extra tape reels, cables, test instruments, etc.

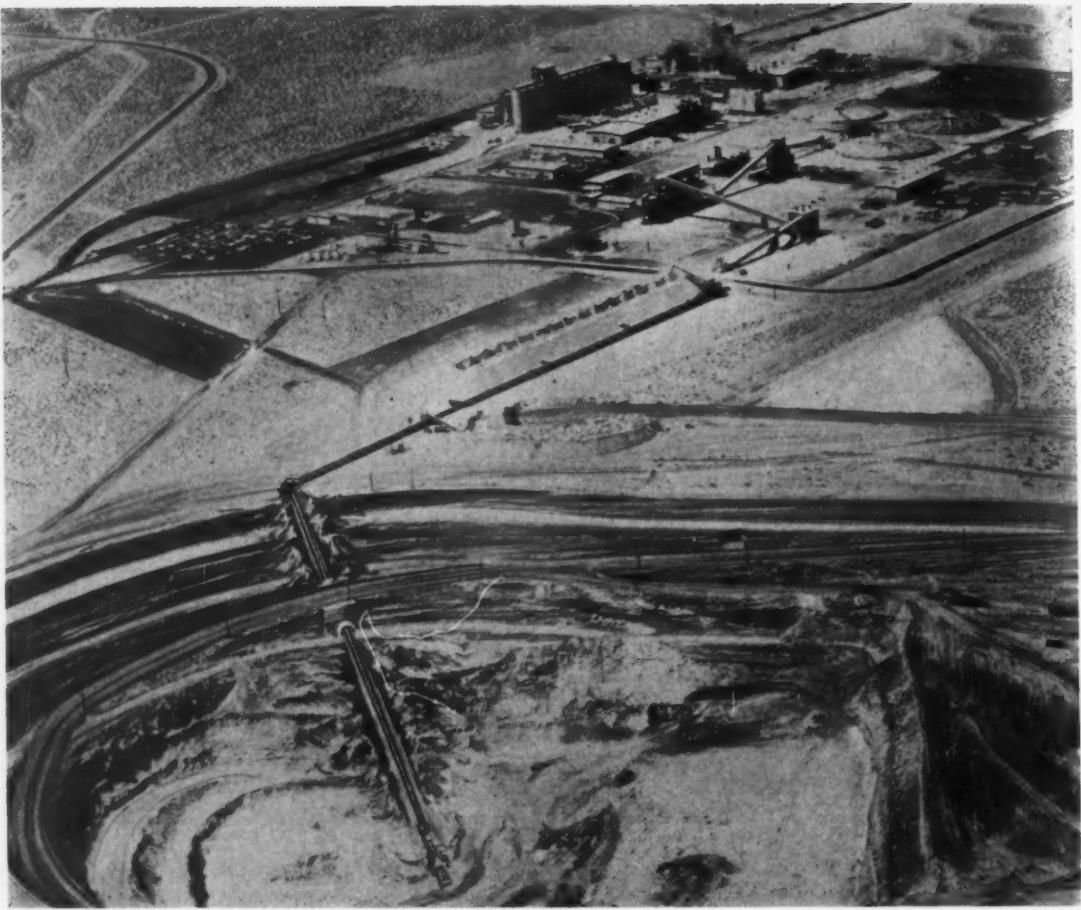
Of vital importance to the new product was its basic cabinet construction for this must offer design features that could be adapted to other Ampex products being conceived concurrently. During this preliminary sketch-and-yard layout stage, engineers built a structural model to determine the feasibility and structural strength of the over-all design. Harvey Aluminum Company of Los Angeles rushed aluminum extrusions to the Ampex manufacturing facilities to be machined. Reliable Pattern Works & Foundry of San Jose, California

made the pattern and aluminum castings. These components were assembled into a structure consisting of four aluminum corner posts jointed to top and bottom castings to form the new recorder's cabinet rack.

Successful tests, which proved the rigidity of the structure, were followed by construction of a quarter-scale model. This step proved conclusively the advisability of building the machine in a double rack, but it also proved a desirable interchangeability in the design. For it showed that where space is at a premium, Ampex could supply the recorder in a single rack with some sacrifice of operator convenience.

The versatile design was approved by management and construction of a full-scale model authorized. The project was to be accomplished with no sacrifice in time or money—with industrial design secondary only to performance and reliability.

The full-scale model proved an excellent proving ground for color tests. Panels and trim for the machine were made in various colors and photographed on the machine, one after another, for comparative study. As a result, the new recorder is offered with panels in any one of four colors—dark red, burnt orange, gray-green, or medium blue.



AERIAL VIEW OF THE Boron, California open pit mine and adjacent plant, shows artist's rendering of 1300-ft. conveyor system that is under construction this month.

LONG CONVEYOR to haul from pit to plant

1300-ft. conveyor system will eliminate present
2½ mile trucking operation bringing ore to plant.

A 1300-FT. MECHANIZED CONVEYOR system is being built for United States Borax and Chemical Corp. at their extensive Boron, Calif. open pit mining operations to replace a costly hauling operation from the bottom of the sodium borate deposit and to provide greater ore-hauling capacity.

A fleet of trucks currently brings ore from the pit to an ore crusher on the surface, a climb of 275 ft. To reach the crusher, trucks must travel 2.5 miles of access roads crisscrossing the 2000-ft.-long, 1700-ft.-wide mine.

Construction is planned to begin this month. When completed, the continuous belt will rise 315-ft. to the surface. From there ore will be conveyed to the adjacent plant for further processing.

According to company President James M. Gerstley, the belt conveyor system had been envisioned for the open pit mine whenever the productive area had been developed enough to allow a permanent and economic installation.

Company spokesmen say that for their operation the conveyor is cheaper to operate than trucks and can be designed to handle substantial increases in ore-hauling capacity without constant additional capital outlay.

Trucks still will be used in the pit to transport ore from electrically powered shovels to the hammer mill that will be installed at the bottom end of the conveyor.

Open pit operations have been carried on here since 1956.

EPOXIES their use in floor maintenance

by William C. Hodges, President
Hodges Chemical Company

EPOXIES ARE GENERALLY conceded to be the finest, most versatile of all organic bonding resins. Properly formulated and just as properly applied, they cannot be surpassed for applications requiring exceptionally high bond strength and resistance to acids, chemicals, water, wear, abrasion and temperature changes.

But before showing how epoxy compounds can help cut costs in repair, maintenance and construction of floors, it is important to know what these plastics cannot do. There is a general impression that an epoxy is the "miracle" answer to every floor maintenance problem. It would be just as sensible to say that the same steel could be used for both rivets and cutting tools.

a) Epoxies won't bond to dirty concrete or dirty anything, as far as practical applications are concerned. Bonding surfaces must be clean, dry and free of loose materials.

b) Epoxies should not be used when the temperature falls below 50 F. Hardening of the resin is slowed down and bond strength may be affected.

c) Epoxies won't bond to contaminated concrete unless the concrete is thoroughly prepared to receive an epoxy, which may have to be especially compounded to meet such conditions.

d) One epoxy compound cannot meet every construction requirement. Many unnecessary failures have resulted because of this supposition. Maintenance engineers must specify the range of floor service conditions if the formulator is to supply the one exact compound to meet these requirements.

e) Epoxies should not be specified without some knowledge of the types of epoxy products available: toppings, mortars, joint fillers, sealers and bonding agents—plus instruction on the use of these products, covering proper mixing of resin and hardener, use of sand and/or aggregate mixtures, spraying and troweling techniques, tool cleaning, etc.

f) Epoxies containing amine hardening agents can cause dermatitis in skin-sensitive workers and should be handled with the same caution shown to any caustic material.

g) Mistakes made with epoxies can be nightmares. Once they cure, the resins are almost impossible to remove.

h) Solvent-based epoxies are not recommended for extremely rugged service conditions. Solvents evaporate out and cause shrinkage of the cured epoxy in addition to pinholes in the cured film.

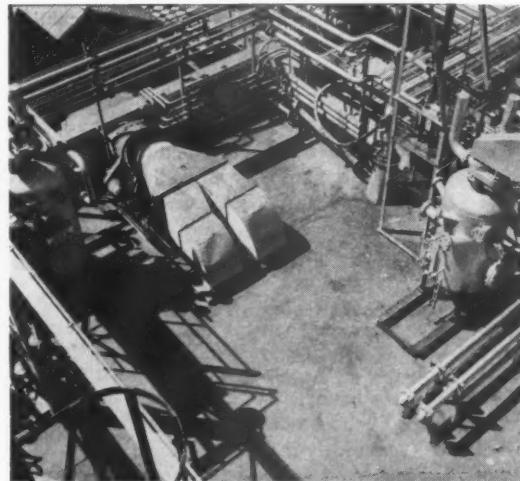
Properly used epoxies can solve many difficult maintenance problems. Here is a discussion of their many uses and their limitations.

ADVANTAGES OUTWEIGH DISADVANTAGES

If the foregoing list doesn't faze you, here are the many varied advantages of 100 per cent solids epoxy surface protectants. These solvent-free epoxies bond permanently to concrete, steel, wood and most other structural flooring materials. Bond strengths in compression, shear and flexure are greater than concrete itself. Epoxies can be trowelled easily in layers from 1/16-in. to 1/4-in., and can be feathered. (The thicker layers of resin are desirable in areas where heavy loads and impacts may prove troublesome.)

Epoxies can provide absolutely smooth surfaces, or can be skid-resistant by adding fine aggregate to the resin or sprinkling it over the finished surface. Epoxies cure hard in 12 to 24 hours (depending upon air and surface temperatures) with virtually no shrinkage.

In short, epoxies are excellent for surfacing all types of industrial floors exposed to severe corrosive attack, vehicular abuse, vibration and pounding. When applied over concrete floors, they completely eliminate dusting



LIVE STEAM and HCL corrosion from underneath caused concrete walking deck at Shell Development Co.'s Market Development building at Emory-ville to rapidly deteriorate, and rain water to seep to equipment handling area below. Application of Hycon Guardkote-140 on concrete eliminated the trouble.



TWO YEARS OF DAILY ATTACK by fruit acids and sugar concentrates have not affected the epoxy toppings applied to preserve-cooking area of ADS Food Products, Inc. Tough resin-surfaced floor contrasts sharply with old, heavily-eroded floor section at lower right.

and pitting. Typical factory floor installations where solvent-free epoxies already have demonstrated chemical and wear resistance include: food and chemical processing, metal plating and pickling, warehouses, production rooms, breweries, oil refineries and dairies.

Epoxies are used on loading docks, ramps, stairs and walkways to both protect the base material and to minimize accidents formerly caused by wet or oily surfaces.

Cost-wise, epoxy toppings are more economical because they dispense with the need to remove existing concrete floors in order to repair them. Depending upon the area to be covered, Hycon® epoxy toppings may cost less than \$1.00/sq. ft. applied for most normal service applications. By comparison, the average cost to rip out and replace a floor with fresh concrete costs from \$1.30 to \$2.20/sq. ft. But regardless of the savings, epoxies can be applied faster, will be ready for service sooner and will last longer than concrete.

APPLICATIONS ARE VARIED

ADS Food Products, Inc., San Jose, Calif. Over two years ago this company was faced with a serious floor erosion problem in their preserve-cooking area. Fruit acids and sugar concentrates literally ate their way into the special, supposedly-resistant concrete floor. As a result, aggregate was extensively exposed. Not only was this condition unsightly and unsanitary, but the rough pitted surfaces were difficult to clean and created a hazard.

After several unsuccessful attempts to remedy the situation with conventional materials, the maintenance engineers decided to test a solvent-free epoxy topping. Two 12 x 18 in. test patches of this acid-resistant top-

ping were placed in the affected area, and adjacent to a nearby worktable from which 50 per cent citric acid solutions were dispensed.

Three months of daily exposure to fruit acids had no effect on these test patches, but the concrete around the edges had eroded another $\frac{1}{8}$ -in. The company then ordered the resurfacing of the entire preserve-cooking area. Over two years later, the epoxy topping is slightly discolored, but at no point is there any scarring, pitting or erosion. Furthermore, the former hazardous slippery condition has been eliminated by the non-slip feature of this topping.

General Electric Company, Burlingame, Calif. The vinyl tile floor in this company's cafeteria was once smooth and level. Personnel could walk from counter to tables without tripping or spilling a drop of coffee. But within a short time after the tile was laid, hydrostatic pressure on the concrete slab popped up and buckled the tiles until the floor was a complete ruin.

Ordinarily, this is a difficult repair problem. But a characteristic of specialized epoxy sealants makes them an ideal solution. Tests for resistance to hydrostatic pressure have demonstrated that solvent-free epoxy sealants can resist an external hydrostatic head up to 40 ft. without water seepage, cracks or blisters and with no loss of adhesion to the concrete.

To repair the cafeteria floor, the tile was removed and the concrete surface was sandblasted. The epoxy sealant was then applied over the entire area, allowed to cure, then belt-sanded to a smooth, even surface. Tile was replaced directly onto the sealant. Many months later the floor is still smooth and unbroken, for the sealant has effectively throttled the hydrostatic pressure.

UNIVERSAL MACHINE solves jet engine overhaul problem

New 25-ton machine tool machines and grinds wide variety of parts

UNITED AIR LINES is revolutionizing jet engine overhaul at its new South San Francisco maintenance base by means of a new type of vertical machine tool capable of a variety of grinding, boring, facing, turning and associated operations.

The machine, a Heald 578 vertical, can handle such large parts as turbine engine difuser cases, being able to accommodate work up to 52 in. in diameter and 48 in. high. It is also versatile enough to do such jobs as grinding tips of rotor blades; turning IDs and shoulders of aluminum rings in stator blades; turning and grinding stainless steel difuser case joints; grinding bearing seats on shafts and in rotor shaft bores; and a variety of toolroom jobs.

Jet parts require a large machine with great swing and travel, rigidity to handle big components but with a light touch for smaller aircraft parts. Flexibility for machining several types of metal on the same equipment demands greater versatility in speeds, feeds and controls.

This machine, a 25 ton vertical, is 15 ft. high, 15 ft. wide and 12 ft. deep. Its 10 ton slide assembly incorporates both a grinding head and a metal cutting turret. The five position turret cutting compound, used primarily for roughing, holds five single point tools for boring, facing, turning and associated operations. The grinding head is used for finishing operations and is capable of internal, face, external and rotary surface grinding. Work table capacity allows face grinding of 4 ft. long shafts. Table speeds range from 2½ to 180 rpm. Slides reciprocate at the rate of 0 to 10 ft. per min. Both cutting and grinding slides have a 20 in.



GRINDING BIG STAINLESS steel turbine difuser case at United Air Lines South San Francisco maintenance base, the model 578 vertical is remotely controlled from pendant while machine is operating.

travel and can swivel 45 degrees to either side of vertical for angular operations.

Because of its universal qualities and extreme flexibility the machine represents an answer to the problems inherent in jet remanufacture, which differ sharply from overhaul practices encountered in piston engines.

NEW TYPE BOLTS cut construction costs

Fewer men per crew are needed with high tensile bearing bolts.

IN THE CONSTRUCTION of a rigged frame warehouse for the United States Potash Company at Loving, New Mexico, the use of a new type of bolt reduced costs by \$900. Patterson Steel Company was able to realize a savings of \$.10 per fastener on a job requiring 9000, by using Lamson & Sessions high tensile bearing bolts instead of driving hot rivets.

The savings was achieved by a reduction of manpower. With these bolts, the two crews aloft were reduced from three men per crew to two. Also instead of needing one ground man for each crew, it was found that one ground man could keep both crews supplied with material.

With the hot rivet method, one man aloft must heat the rivets with a forge, the second is the riveter, and the third is the 'bucker up.' Two men in the bolt crew, however, are enough. One drives the bolt in, and the

other secures it.

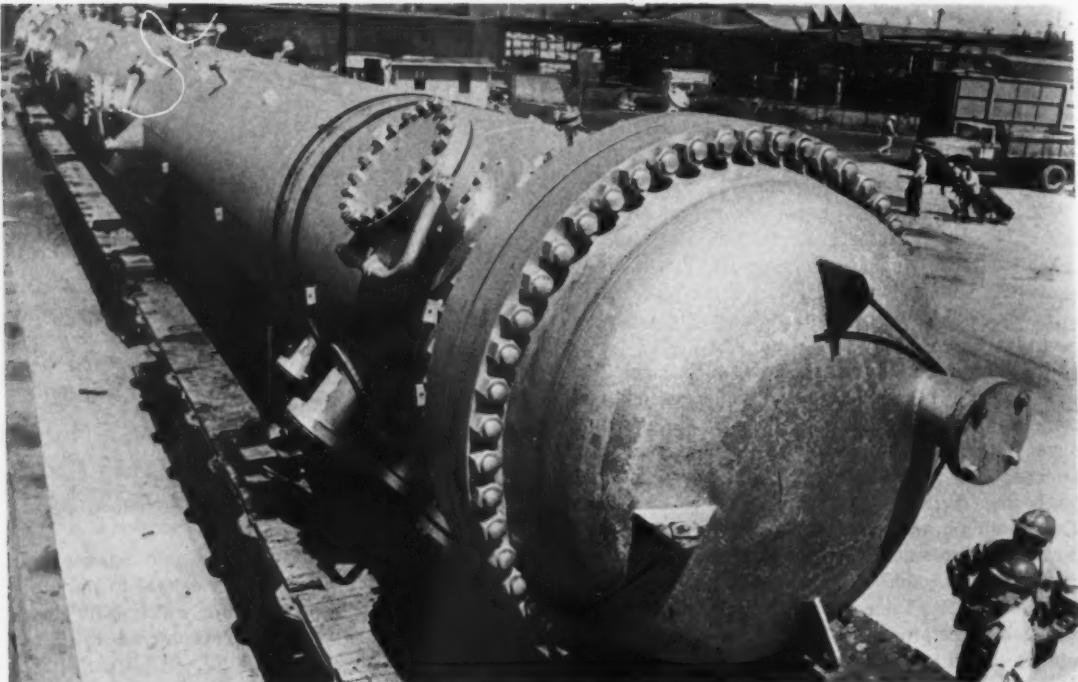
The bearing bolt is designed with a knurled body so that the men when driving it force it through a structural hole slightly smaller than the bolt itself, the bolt fills the hole as a rivet does. This insures complete contact between the structural parts and the full length of the bolt and provides rigid connections from member to member. It is this proper bearing that provides the strength needed for high stress applications.

The building measures 150 ft. by 600 ft. Highest part of the arch is 57 ft. above the foundation floor and the bolts are used in the principal structural members, the main and end ribs, and the conveyor frames.

The bolts used in the construction were supplied by U. S. Steel Supply Division, sole distributors of Lamson & Sessions high tensile bearing bolts.

NEW H-IRON PROCESS bypasses use of blast furnace

Pulverized iron ore is placed in vessel under heat and pressure. Hydrogen gas contacts ore, draws oxygen from it and sets crude iron free.



KEY TO H-IRON PROCESS is huge welded pressure vessel made from 2 1/8-in. thick chrome-moly shell plate. Vessel will process iron ore into crude metallic iron without blast furnace.

WITH ARRIVAL, VIA FLATCARS, of a 238-ton pressure vessel in Los Angeles, Bethlehem Steel Co. now has the key device for a pilot H-iron plant that will be capable of producing usable iron directly from high grade ore without use of a blast furnace.

The 6 1/2-ft. OD welded vessel will be installed in an 80,000 sq. ft. plantsite at Bethlehem's south Boyle Ave. facility in Vernon, Calif. With this reducer, the plant is expected to turn out 110-tons of metallic iron pellets daily. Raw material will be iron ore shipped to Los Angeles by boat from Venezuela.

This output will be processed into steel by electric arc furnace. Briefly, this is how the process works. Pulverized iron ore is placed in the vessel after a drying and pre-heating cycle. Hydrogen gas, that has been purged of impurities, contacts the ore and draws oxygen from it, thereby setting crude iron free. Ore enters the top of the vessel and is reduced to H-iron by the time it exits at the bottom. The process is accomplished

under heat and pressure, from 490 psi to 570 psi and at approximately 900° F.

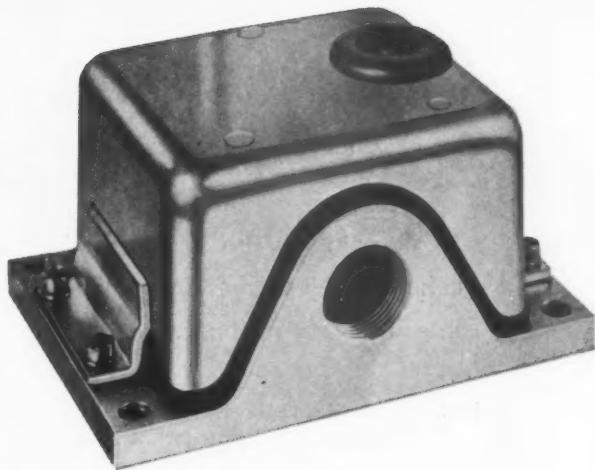
According to Bethlehem spokesmen, the process has certain advantages, primarily the by-passing of the blast furnace that is an expensive item to build and maintain, requires coking coals that are in limited supply in the West, and uses large quantities of fluxing materials.

The new plant, built for Bethlehem by Hydrocarbon Research, uses hydrogen as a prime mover. This is a relatively cheap material that can be obtained from many sources. H-iron is also an ideal charge for electric furnaces.

The plant is engineered to fit stringent air pollution regulations and avoids some of the blast furnace problems connected with smoke, fumes, and particulate matter.

Other components of the pilot plant will include drying and grinding equipment for processing the Venezuelan ore, a hydrogen production unit and machinery to convert crude metallic iron in briquettes suitable for charging the furnace.

DEVICE SENSES malfunctions in operating machinery through off-normal vibrations. Called the Vibraswitch Model #66 it can protect wide range of rotating or reciprocating machinery.



MACHINERY PROTECTION with vibration cut-off device

Device will sense unusual vibrations on rotary or reciprocating machinery and automatically cut power before damage results.

EXCESSIVE OR UNUSUAL VIBRATION can be a danger signal that when properly heeded can take machinery out of operation before damage results in costly repairs and perhaps loss of production.

With this preventive theory in mind, Pacific Northwest Alloys, Inc., Spokane, Wash., producer of high grade special steel alloys for metalworking firms, is utilizing a Robertshaw "Vibraswitch" vibration detector to provide automatic shutdown protection for a large motor-driven compressor that serves the plant.

The compressor is a 2 cylinder, 2 stage reciprocating unit powered by a heavy duty electric motor running at about 400 rpm. Since the compressor runs almost constantly and is the primary air source for plant operation, it must function efficiently.

Since installation of a Robertshaw Model #61 malfunction detector, (now repackaged as the Robertshaw Model #66) the compressor has been stopped for malfunctions on at least five occasions. Three stoppages were caused by loose or broken bearing cap screws. In another instance, a broken bearing cap bolt caused off-normal vibrations that were readily detected by the Vibraswitch, causing an automatic alarm and shutdown.

Another automatic stoppage occurred during malfunction in the high pressure side valve lifter assembly, a condition that if neglected would have resulted in serious breakdown.

Although vibration was not substantial, the malfunctions caused a specific type of motion rapidly sensed

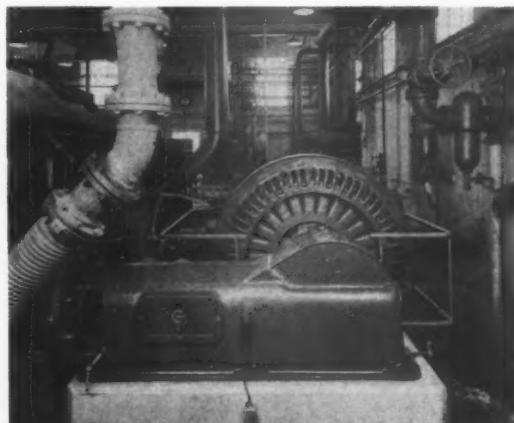
by the device. The monitor frees supervisory manpower for other work and is constantly on the alert.

The model #66 Vibraswitch can be attached to virtually all types of rotating or reciprocating machinery. It detects low-frequency displacements as well as high-

Another model, #67 Vibraswitch, developed by Robertshaw Fulton Controls, Anaheim, Calif., can be used for applications where electric power is unavailable or unwanted and where pneumatic pressure abounds or where pressure sensing devices are already frequency accelerations.

used on pneumatic lines.

The unit, packaged in weather and explosion-proof cases, can detect physical increase in motion, increase in velocity based on shaking motion, and acceleration changes direction.



LARGE MOTOR DRIVEN compressor is protected with electrically driven Vibraswitch. Any unusual vibrations will immediately be detected by device that turns off compressor-driver complex.

THREADING LATHE

cuts part costs

Single point tool on super speed lathe has advantages over other thread cutting methods.

WITH ADVANCEMENT IN COMPLEXITY of close tolerance threaded parts for use in industrial and defense applications, firms specializing in thread grinding, tapping, and thread milling have been faced with jobs having tough specifications involving unusual dimensions and hard-to-machine materials.

Cost factors on these items can make bidding difficult and specifications often rule out use of standard equipment because of time, labor and tooling outlay, especially in prototype work.

Screw Products Corp. of America, South Gate, Calif. is using a Model 2" Man-Au-Cycle super speed threading lathe on a number of difficult threading jobs at substantial savings over standard methods of thread milling and hobbing, lathe chasing, tapping and grinding.

The machine, distributed by S&S Machinery Co. of Los Angeles and other principal cities, operates to automatically single point cut inside and outside threads and is capable of performing taper, multi-start, standard, and special leads. It can be used with



TYPICAL WORK performed by threading lathe. Large 4-in. OD swivel joint nipple of 8620 steel shown before and after threading operation. Four threads per inch were cut by carbide tooling.

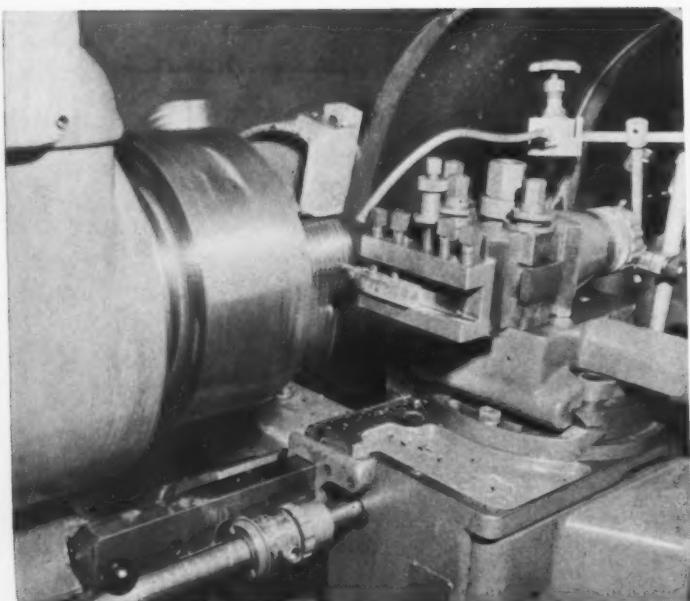
a full range of high speed carbide and ceramic tooling. The machine employs an automatic cycle taking multi-passes with each pass using an additional increment of depth and diminishing for finish and accuracy. The cycle is automatically set.

For example, a 4 pitch Acme type thread, 12-in. long, was cut in 4130 heat treated steel in one hour and 15 minutes by a conventional lathe single point operation. To cut time, an outlay of approximately \$75.00 for a hob would be required. This would cut machining time to $\frac{1}{2}$ hour. The Man-Au-Cycle used a standard \$3.00 single point tool bit and threaded the part on 7 minutes.

Despite the speed of the jobs performed on the lathe, finishes are often comparable to a ground thread and no further finishing operations are required in most cases.

Setup time on the Man-Au-Cycle is less than 45 minutes for most jobs compared with an average $2\frac{1}{2}$ to 3 hr. labor cycle for thread mill preparation, according to Jim Compas, Asst. Superintendent at Screw Products. Setup time figures on the threading lathe were taken prior to installation of an air chuck that would cut additional time from setup operations.

The Man-Au-Cycle is similar in appearance to a heavy duty, standard screw cutting lathe and work is introduced as in a standard lathe. The workpiece is fixtured to and driven by the headstock spindle with or without a steady rest support. Gearing can rapidly be changed in accordance with charts to obtain proper lead requirements.



TOOL ENGAGED and cutting nipple. Using a carbide tool, lathe turns out part at fraction of cost required by preparation of hob or milling the part



JOB SAFETY ANALYSIS programs are described by J. Richard Rhodes, Bethlehem Steel. Analysis is detailed written report on hazards of job made by departmental supervisors.



TYING A KNOT in a wire sling is R. J. Erickson of Union Wire Rope Co., one of firms exhibiting at Safety Congress. Knot shows extreme flexibility of sling that is braided for longer service, safety.

SAFETY CONGRESS new ideas and products

Industrial engineers and management personnel learned a lot at the recent Western Safety Congress. Here are the highlights of what they saw.

THE CONTRIBUTIONS OF INDUSTRY to the national accident toll, that last year killed 91,000 and injured 100 times that many, were probed during the three-day 7th Annual Western Safety Congress and Exhibits at the Los Angeles Ambassador.

The event, that drew more than 5000 visitors, found more than 200 safety specialists participating in 50 programs. Manufacturers of safety equipment and plant maintenance items occupied a 100-booth exhibit area.

For representatives of western industrial firms, special programs were presented under the sponsoring National Safety Council industrial division. The chemical and electronic industries were allotted a two-day program. Similar panel sessions and seminars were programmed for the food processing, rubber, construction, machine shop and paper products firms.

For men on the foremen and supervisor level, a special training course was given as a supplement to

in-plant training programs. Four, one-hour sessions on industrial safety were planned by the four major steel companies.

Neil D. Kellogg, safety engineer, Consolidated Western Steel, Div. U. S. Steel Corp. coupled his talk on "Knowing's Not Enough" with a film of the same name that described the U. S. Steel "yellow flag" program. This is an attempt to impart caution to employees who cause accidents by succumbing to what is described in a catch phrase as the four imps, impunity, impulsive, improving and impatience. Impunity, of course, is the "can't happen to me" attitude.

The yellow flag is symbolic of caution before action. Kellogg stated that accidents happened time after time to employees who had been thoroughly indoctrinated with safety programs because caution was temporarily suspended by one of these compulsive attitudes. He concluded that the employees must be contacted by supervisors who will make them comprehend the dan-



JIM BROOKSHIRE, District Manager of Hild, lifts cover of Hild Model 455 convertible vacuum tank that will pick up solids or liquids. Top can be fitted to any standard container.



AT THE CONTROLS of the Mefco Hydra-Set is Al Gebbhardt, Mefco Sales & Service Corp. Unit is auxiliary crane and hoist control for delicate load positioning.

gers connected with their job.

This will cut the 31% accident toll in industry caused by direct unsafe practices, he said.

J. Richard Rhodes, management's representative, for Bethlehem Steel Corp., Pacific Coast Div., presented Bethlehem's job safety analysis program. This is a detailed, and on the spot evaluation of job danger potentials made by supervisors. They analyze operations only under their direct jurisdiction.

For example, take the duties of a lift truck operator at Bethlehem who empties scrap from a container at a layout area. His job is broken down by the supervisor into three areas: "Principal Steps of Operation," as

they normally occur; "Hazards," and "Safety Precautions," to eliminate the hazards.

Steps of operation are listed along with the precautions by the supervisor who is urged to take a number of days to carefully watch the operation and to look for trouble spots. His findings are duplicated and distributed not only to other supervisors but to the fork truck operator and to other employees in that section.

Other steel industry speakers were Jack Shrum, safety supervisor, Kaiser Steel, on the "Man Side of Accident Prevention" and Edmund J. Ahlstrom, safety and plant protection supervisor, Columbia-Geneva, Div., US Steel, on "Fact Finding-Not Fault Finding."

BETHLEHEM STEEL JOB SAFETY ANALYSIS

Operation—Emptying scrap box at Layout Area

PRINCIPAL STEPS OF OPERATION

1. Operator approaches scrap area in Lift Truck
2. Pick up Scrap Box
3. Take box to scrap car
4. Dump box
5. Return box to Scrap Location.

HAZARDS

1. Danger of being hit by moving material or equipment. Hitting pedestrians.
2. Box falling as it is lifted. Box spilling because it is overloaded.
3. Same as 1.
4. Scrap spilling back over operator or on floor.
5. Box may tip if automatic latch has not caught. Also same as one.

Operator's Title—Lift Truck Operator

SAFETY PRECAUTIONS

1. Stop—look to the left and right, find out if there is anything moving. Sound horn.
2. Inspect box. If too full call foreman. Center forks under box. Enter forks slowly.
3. Same as 1.
4. Box must be over car when dumped. Keep alert—keep eye on box as it is hoisted into dumping position.
5. Inspect box to be sure it is latched. Same as 1.

SARCO

Inside story on automatic cooling control



... for compressors,
small engines,
oil coolers,
water-cooled rolls,
condensers,
water-cooled bearings,
and other cooling
applications.

Self-powered
SARCO T-44
— no compressed
air or electricity
needed.

Simple, gadget-free design. Fully modulating. Sensitive liquid-filled thermostat gives you uniform movement of valve for each degree of temperature change, at all points on the range. Packless — no stuffing box — no leaks — no valve stem jamming. Self-contained — no part of mechanism exposed. Dependable and inexpensive — thousands in service. So reasonable in cost, you can afford Sarco automatic cooling controls for every application.

Sarco T-44 self-powered cooling control is available in standard 50° adjustment ranges: 60-110° F., 85-135° F., 110-160° F. and 135-185° F. Sizes: $\frac{3}{8}$ ", $\frac{1}{2}$ " and 1".

For the full story on Sarco Cooling Controls...

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WESTERN INDUSTRY/MAY 1960



Johnson Bronze Speeds Quality Bearings, Bushings, Bars to You

That's because Johnson Bronze service blankets the West Coast through its plant in Oakland, Calif., warehouses in Los Angeles and Seattle and a network of industrial distributors.

Johnson's West Coast plant is completely equipped to manufacture special bronze castings and bearings and provide fast machine shop service. In addition, this facility, the warehouses and distributor network can serve any of your bearing needs for . . . General Purpose, Graphited, Electric Motor and Powdered Metal Bearings, SAE 660 Bearing Bronze Bars (from 13 to 105 inches long) and Aluminum Bronze Bars. You name it and Johnson has it *here* on the West Coast.

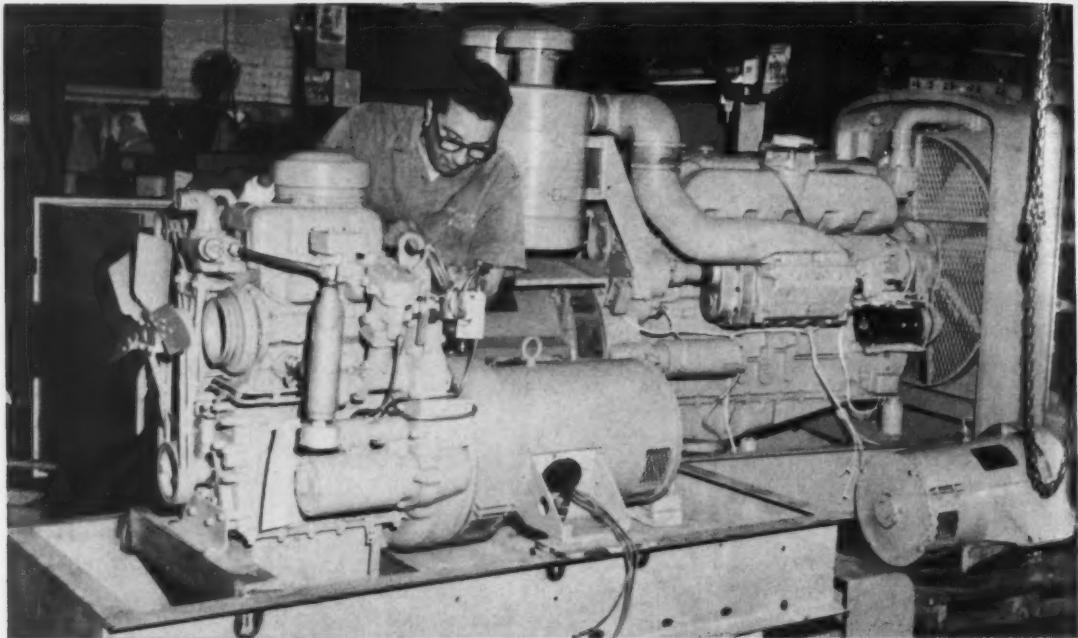
Call your Johnson warehouse or distributor for immediate service. Or, send your blueprint or specification to our Oakland plant for a quotation on your special requirements.

Johnson Bronze Company

Oakland 8, Calif.



... for more details, circle No. 20 on Reader Service Postcard



WIDE VARIETY OF ELECTRICAL OUTPUT is available in generators. Set, foreground, is a 2 cylinder diesel rated at 15 kw. Larger radiator-cooled set, rear, has 6 cylinders, produces 150 kw.

STANDBY POWER for critical functions

Auxiliary power is being used to guard critical plant operations, protect communications and lighting in mass assembly areas and in the open where regular power is not available.

WHAT HAPPENS WHEN the lights go out? Not a highly probable occurrence when plants are serviced by modern utility companies. But emergencies do arise. A vehicle collides with a power pole, a severe storm brings high tension lines to the ground, a transformer fails.

Crack emergency crews soon are on the way from the power company, but for a certain period employees will be in the dark, machines will stop, communication ends.

The concept of standby emergency power in the West has been emphasized in recent years by governmental and civil defense agencies that have stressed the need for in-plant maintenance of communications, especially fire alarm signals and air raid alarms, and lighting of first aid rooms, highly populated office buildings and places of mass assembly in the plant

such as auditoriums, cafeterias and fabrication areas without natural light. Here sudden darkness could cause panic and loss of life.

With this in mind, western plant and safety engineers have huddled with industrial architects and designers and in many cases are incorporating standby power as a vital part of plant equipment.

For example, the Torrance Works of Columbia-Geneva Div., United States Steel Corp. uses standby power as a safeguard against major electrical failure during critical heat periods with induction furnaces. They also have a small generator unit to provide electricity for the first aid department.

Lockheed Aircraft Corp., Burbank, Calif. has installed a system of 25 kw generators that will spring into action the minute lighting circuits fail. This restores illumination to vital corridors leading to exits.

Also on tap is a portable unit for minor power failures.

Many of these standby generator sets are diesel-powered because of engine reliability and a fuel that is not plagued with critical volatility, expansion or evaporation under long-term storage.

A builder of diesel-powered units in Los Angeles is Anderson-O'Brien Co., a firm that produces a wide range of generator sets ranging from tiny standby units with 10 kw capacity to huge 750 kw sets capable of lighting a small community.

The larger sets, designed to give power to plants and buildings, are installed as permanent fixtures just like plumbing, air conditioning, and other building services.

Because of their standby mission, sets are highly automatic and are equipped to start instantly in the event of power failure. Since they may have to run long periods unattended, engines are fitted with oil and water failure controls that will either shut off the engine or will sound a highly audible alarm horn signal. Another automatic shutdown, on many sets, is in case of speed in excess of 110% of operating RPM.

A typical installation recently made in the California Bank Building, Los Angeles, involved an Anderson O'Brien model DAP 300 set powered by two 6 cylinder General Motors diesel series 6-110 diesel engines. These were linked by a clutch operated chain driven power transmission unit that brought 550 hp at 1800 rpm to a 300 kw Delco AC generator. This can deliver 480 volts of 3-phase, 60-cycle current in a proverbial split second.

During construction of the set, powerplant, generators and control equipment are permanently aligned and mounted to cross-braced I beams provided with bolt holes for securing to floors or foundations. The set is 163-in. long, 78 1/4-in. wide, and 91-in. from

floor to center of overhead exhaust stacks.

Since the set was installed inside the building, the exhaust system was built with a noise level suitable for residential areas. An 8-in. iron pipe leads from exhaust manifolding to a three chamber muffler that is linked to the outside of the building with flexible tubing.

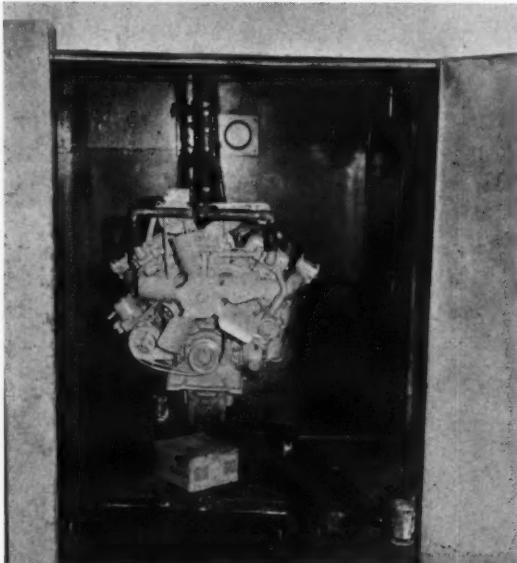
The engine is fitted with a four-way control system to allow operation under simulated emergency conditions during routine checkouts. The control is provided with Off, Automatic, Manual and Test positions. Off completely invalidates the system. Automatic operates the set in case of power failure or a programmed start. In Manual, the engine controls are operated via push-button. In the Test position, the engine will start and operates through all the automatic controls.

An automatic 30-day clock can be provided to allow an automatic and unattended start with ten minute running periods at 3-day intervals. Performance is indicated on a dial chart and stylus device. In event of failure during the checkout run, the standby set will stop immediately.

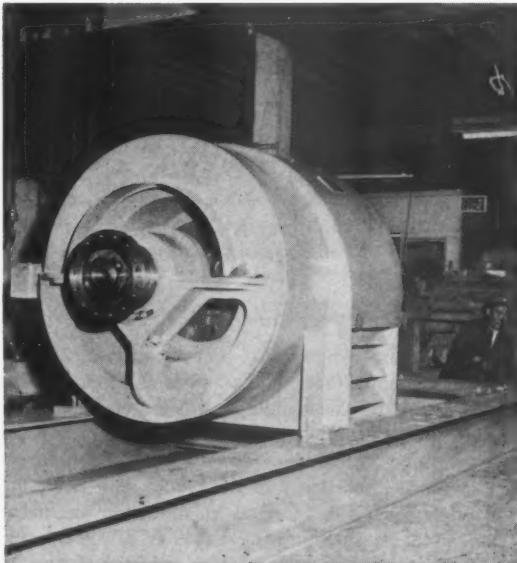
Sets are made as light as possible and offer maximum portability for either skid or trailer mountings. Small exterior dimensions permit them to be moved through narrow doorways or openings, a helpful feature when installing in existing structures.

Highly versatile, sets can be designed to provide power on command from a number of emergency situations other than complete loss of electric service. They can be actuated by a drop in circuit voltage, a change in temperature, gas or water pressure, noise level, even a change in intensity of illumination.

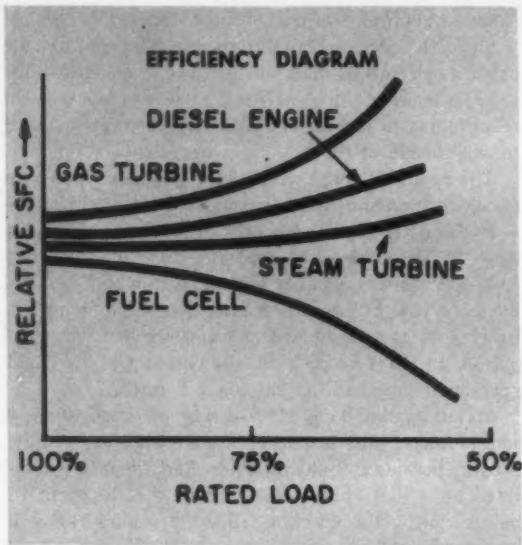
Standby power can serve as a watchdog for numerous industries that depend on constant quality of electricity for perfection of their products and opera-



ANCHORED IN DYNAMETER room is a V-6 GMC diesel engine that will undergo full testing under load prior to installation.



HUGE AC GENERATOR by Westinghouse is rated at about 750 kw and will be powered by four 6-110 series 6 cylinder GMC diesel engines.



tion of sensitive fabrication or processing machinery.

Currently under development in the West are two devices for the production of electricity that could have potential as a portable or standby power source.

One is a small gas turbine that drives a directly-mounted generator that produces 7½ kw in one pilot model and in another unit will produce up to 100 kw of 60 cycle current. These are being developed by Garrett Corp., AiResearch Manufacturing Div., Phoenix, Ariz.

The second is the fuel cell, a device that converts chemical energy directly into electricity, currently under development by the General Electric Co., Aircraft Accessory Turbine Dept., Los Angeles.

The fuel cell, basically, is a dual chambered device one side of which is filled with hydrogen, the other with oxygen. The two are combined under a controlled chemical process to release electrical energy.

Here are more details on each:

The AiResearch high frequency generator, that is on a Western demonstration tour this month, is a GTP-30 small gas turbine driving an induction generator.

Turning at approximately 40,000 rpm, the turbine activates the generator to produce 3200 cps frequency, statically converting it to 7½ kw of 60 cycle, 3 phase, 4 wire grounded neutral power.

Fully automatic, the set can accelerate to full speed and accept a full load in less than 30 seconds, is operable at -65 F. conditions without warmup or pre-heating.

The tour model somewhat precedes introduction of the 100 kw model that pits 800 lbs. total weight against 5800 lbs. of the latest, light-weight diesel-driven generators of equal output.

In addition to features including a 5000-hour overhaul period, insensitivity to dust, cold, and heat, the generator itself is designed as an induction alternator that eliminates such moving parts as brushes, commutators, slip rings, and rotating rectifiers found in conventional sets. No generator service should be required between prime mover overhauls, according to AiResearch spokesmen.

In the General Electric fuel cell, canned hydrogen and atmospheric oxygen are supplied to an 11 by 11-in. container at ambient temperature and pressure. Gasses enter chambers at opposite sides of the cell. Separating the chambers is a plastic membrane. Electrodes, an anode and cathode, are in contact with the membrane surface and the electrolyte.

On the anode side, hydrogen ionizes and electrons that are given off in forming the ions are conducted to the anode terminal. The ions are conducted through the membrane to the cathode side of the cell.

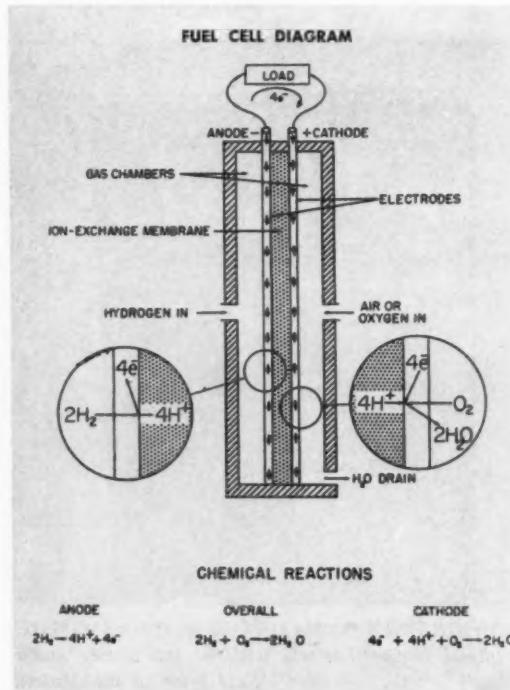
Here oxygen reacts with the electrons that have travelled through the external circuit and the ions that have filtered through the membrane. The overall result is a chemical combining of hydrogen ions and oxygen to form water and to complete the electrical circuit. (see diagram).

In a pilot model, 30 of these cells have been packed into a suitcase-like power package, 22 by 15 by 14-in. that is capable of producing 200 watts of 22 to 28 volts of direct current. Weight is 30 lbs. Cell life is 2000 hours minimum and a six-pound canister of hydrogen provides 14-hours of operation at full load.

The 30-lbs. of power pack takes the place of a 55 lb. engine-generator set or 80 lbs. of secondary batteries, in a standby power situation.

In its operation, the fuel cell has one basic characteristic common to conventional power conversion equipment such as engine-generators or turbine generator sets. That is, fuel is fed into one side and electricity comes out the other.

While conventional devices become less efficient as they go from design loads to idling, the fuel cell becomes more efficient at partial load, especially from the fuel consumption standpoint.



MORSE'S strategic locations blanket the West Coast to serve you better

Faster service on all power transmission products

Here's the ever-expanding picture of Morse's increasing efforts to bring you fast, off-the-shelf delivery of all Morse power transmission parts.

The latest addition in the 9 "star" outlets is the new Morse *Master* warehouse at Los Angeles. This recently opened factory branch, like the others, affords the special services of factory-trained engineers and sales personnel to help you solve any power drive problem. One of the most important things to remember is that Morse representatives and distributors are always nearby. They are listed in the Yellow Pages of the telephone directory under "Power Transmission." Or write: Morse Chain Company, Dept. 32-50, Ithaca, N. Y. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ontario.

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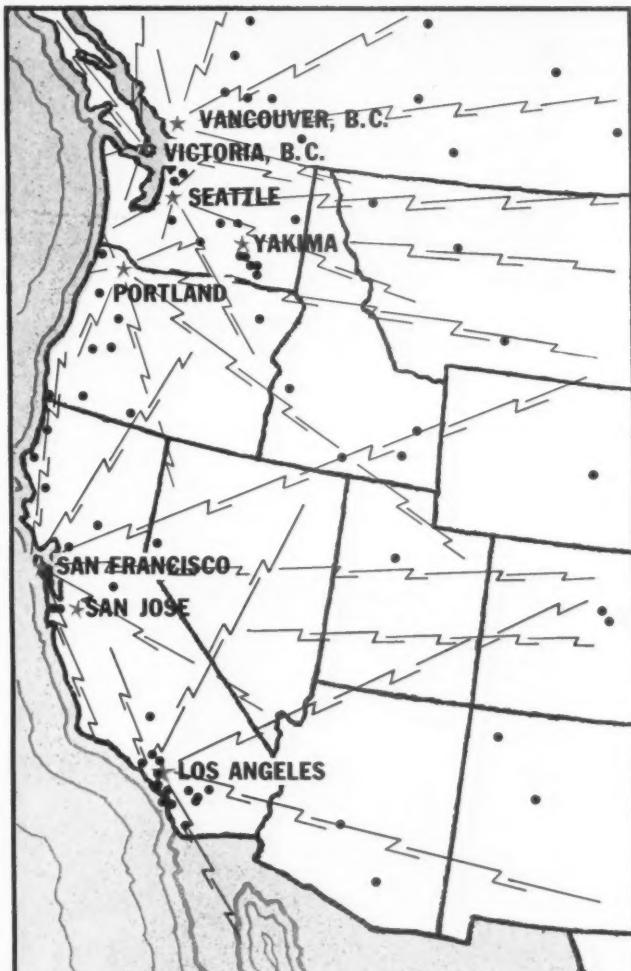
The Adam-Hill Company, 142 Utah Avenue
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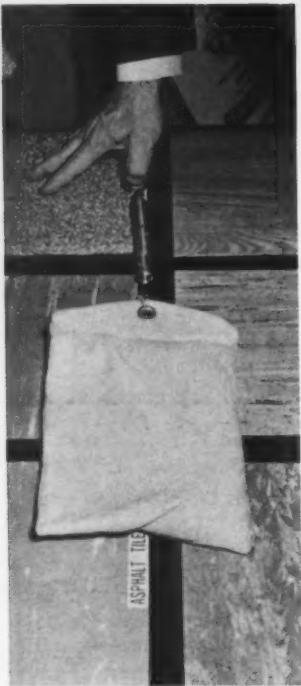
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ONLY MORSE OFFERS ALL FOUR: • CHAIN & "TIMING"® BELT DRIVES • E-D SPEED REDUCERS • COUPLINGS • CLUTCHES

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BAG is just starting to move as scale nears 4-lb. mark. Minimum UL standard is 2.5-lbs. for safe walking.

READY to drop bag on floor. Device held by A. W. Kenney consists of 10 lbs. of shot and 10-lb. capacity scale.



FLOOR WAX TESTER DEVELOPED determines non-slip properties of wax on scale

New testing unit consists of weighted canvas bag and scale calibrated to 10-lbs. pull. New aid in determining workable index for slip resistance on waxed floors.

FUNDAMENTALS OF GOOD FLOOR CARE require that plant maintenance personnel apply sufficient wax to prevent wear or damage to flooring. But equally important is the surface on which people walk. Is it safe underfoot?

Not only are maintenance and plant safety engineers vitally interested in non-slip properties of floor wax, but also the industrial insurance firms who have to represent clients in on-the-job injury cases. Other agencies including the Underwriters Laboratory, American Standards Assn., and the American Chemical Assn. have contributed research and data in determining a workable index for slip resistance.

In order to literally "take a reading" on a waxed floor, a device has been developed that consists simply of a canvas bag filled with 10-lbs. of #10 shot. One end of the bag is fitted with a lip through which a brass bound ring has been inserted.

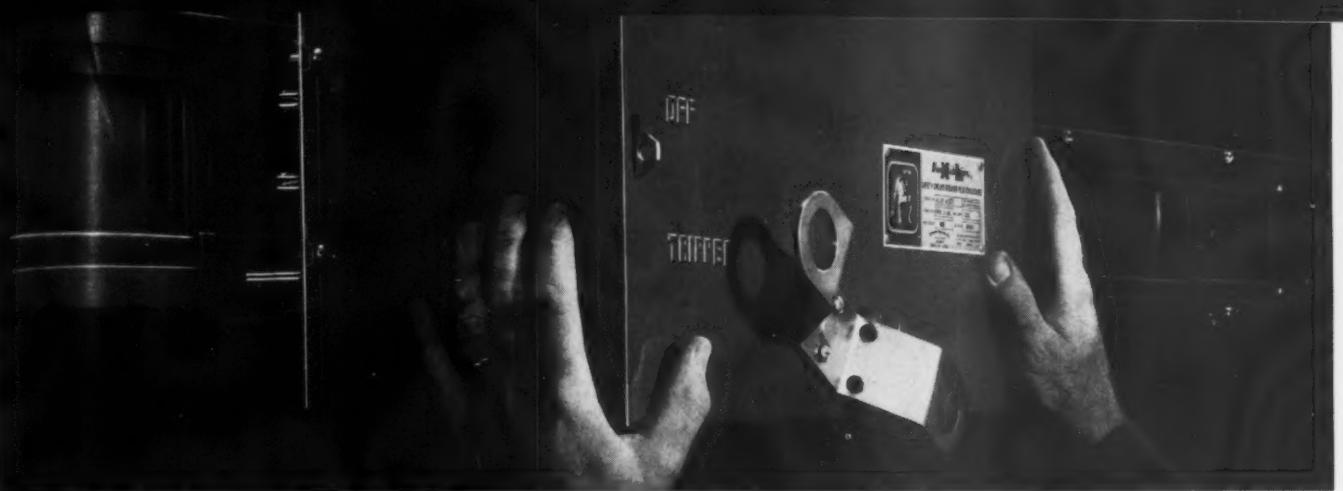
Through this is hooked a Chatillon instrument scale calibrated to a maximum of 10-lbs. pull.

The bag is taken in hand and dropped from about 10-inches above the floor to allow the shot to flatten out and the bag to adhere to the surface. The tester hooks his thumb through the scale ring and pulls.

If the wax-surfaced floor doesn't allow the bag to slip after 2.5 lbs. of pull, the surface has passed the minimum UL standard for slip resistance with a reading of 0.50. The best waxes for anti-slip qualities rarely exceed 0.92 or approximately twice the pull in poundage.

According to A. W. Kenney, Columbia Wax Co., who demonstrated the device at the recent Western Safety Congress in Los Angeles, the American Standards Assn. in cooperation with the American Chemical Manufacturers Assn. has determined that application of a standard water-emulsion wax with a Dupont "Ludox" additive can be used to give a basic determination of slip resistance with the test device.

Although the slip tester and test data have been accepted by the California Workmens Compensation Commission and other agencies, there still exists a marked difference of opinion on what constitutes a slippery or a safe floor.



NEW BULLDOG XL BUSTRIBUTION DUCT...

3 WAYS SAFER FOR PEOPLE AND PROPERTY



HERE'S THE FIRST DEAD-FRONT plug-in duct. Butyl insulation covers the full length of each silvered aluminum bus bar, *even in bus plug openings*. You get positive protection for personnel against accidental contact with "live" bars.

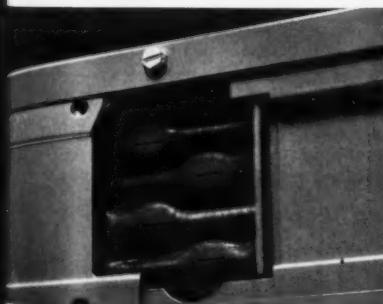
PLUG-IN SAFETY DOOR IS ALWAYS CLOSED during installation of XL Safety Plug. Interlock finger positively prevents plug installation or removal when Safety Door is open . . . and it keeps door from closing against "live" plug fingers.

THERE'S NO ARCING to endanger people or property . . . you can't plug in or unplug when the switch is "ON."

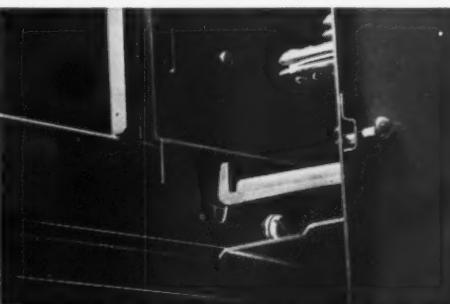
New XL BUStribution® Duct cuts down installation time . . . takes less space . . . reduces duct weight on building structure as much as 40%. Keyed bus ends slip together in a hurry while a single integral bolt locks joints securely under a ton of pressure.

Ask your BullDog distributor to arrange for a demonstration. You'll see how fast-to-install XL BUStribution Duct and matching Safety Plugs really are!

BullDog Electric Products Division, I-T-E Circuit Breaker Company, Box 177, Detroit 32, Michigan. In Canada: 80 Clayton Rd., Toronto 15, Ont. Export Division: 13 East 40th St., New York 16, N. Y.



IT'S TRUE DEAD-FRONT. Each silvered aluminum bus bar is full-length insulated with Butyl envelope.



IT'S A SAFETY DOOR. You can't plug in or unplug with the door open, can't close door on "live" plug fingers.



IT'S A SAFETY PLUG. You can't plug in or unplug against a load . . . safeguards personnel and equipment against arcing.



BULLDOG ELECTRIC PRODUCTS DIVISION
I-T-E CIRCUIT BREAKER COMPANY



Consult the following Pacific Coast representatives:

Coast Electric & Manufacturing Co.
1733 N. E. Seventh Ave., P. O. Box 7712
Portland 12, Oregon

Young Electric & Mfg. Co.
2134 Curtis St.
Denver 2, Colorado

Safety Switchboard Company
910-89th Avenue
Oakland 21, California

BullDog Elec. Prod. Co. of Los Angeles
2885 E. Washington Blvd.
Los Angeles 23, California

... for more details, circle No. 22 on Reader Service Postcard

Breakthrough in gasoline research!



Methyl

**Standard brings industrial and commercial fleet owners
the first new antiknock compound since Ethyl!**

METHYL* has been tested in Standard research laboratories . . . and proved in more than $2\frac{1}{2}$ million miles of road service and other field tests.

Methyl steps up octane performance so effectively that it stops power-wasting knock better than any other antiknock compound. Methyl means a power bonus and quieter performance for engines both old and new.

No other gasoline has anything like it. And it's in Chevron Gasolines—at no increase in price!

*Methyl—trademark for antiknock compound



STANDARD OIL COMPANY OF CALIFORNIA

TRADEMARKS CHEVRON AND CHEVRON DESIGN REG. U.S. PAT. OFF.



SPECIAL MANUALS

FOR YOUR FREE COPY, CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, p. 53

DRIVE BELTS

Wedge V-Belts

Brochure outlines the principle of "wedge" V-belts, discusses the features of wedge V-belt construction and sets forth the advantages and experience in the field. Diagrams of the belt show three cross sections doing the work of five. *Goodyear Tire & Rubber Co., Industrial Products Div.*

... FOR YOUR COPY, CIRCLE NO. 100

Segment Type V-Belting

Bulletin lists ten advantages of segment type V-belting. Explains off-the-spool service, adjustability, installation, maintenance, tension. Gives full engineering data, horsepower ratings and selection chart. Photos show examples of application. *Ton-Tex Corp.*

... FOR YOUR COPY, CIRCLE NO. 101

Adjustable-Diameter Drives

Catalog discusses features, applications and advantages of line of adjustable speed drives. Includes illustrations and diagram of construction of standard adjustable-diameter sheave and wide-range adjustable-diameter sheave. Includes selection information, sheave dimensions, belt dimensions and base dimensions. *Power Transmission Div., American Pulley Co.*

... FOR YOUR COPY, CIRCLE NO. 102

Gripbelts

Data on gripbelts designed for three different uses: on drives with moderate horsepower, small diameter sheaves and short centers; on drives with average size sheaves with resistance to sudden shock loads; and, for heavy duty drives where great shock loads and high tensions are encountered. Specifications include outside length and weight. *Browning Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 103

Compact Belt Drives

Full information, including dimensions and engineering data on a new line of belt drives with sheaves and belts designed to provide greater horsepower capacity with less bulk than conventional V-drives. The new wedge drives are designed to supplement conventional V-drives and extend the effective range of V-drive application, providing new practicability for many installations where other forms of belt drives or chain drives are conventionally applied. *Fort Worth Steel & Machinery Co.*

... FOR YOUR COPY, CIRCLE NO. 104

Drive Width Quick Selection Charts

Five charts for timing belt drives allow quick selection of correct width when designing drives. The copyrighted charts eliminate use of formulas and correction factors. *T. B. Wood's Sons Co.*

... FOR YOUR COPY, CIRCLE NO. 105

Positive Drive

Sixty-page catalog covers the terminology and construction of positive drive belts and positive drive pulleys, sets forth the advantages of positive drive belts; covers pulley construction, dimension tables; hubs dimensions, data, belt stock pitches, selection procedure, horsepower ratings; stock positive drive selections, installation, maintenance; drive design, V-belts and belting. *Durkee-Atwood Co.*

... FOR YOUR COPY, CIRCLE NO. 106

V-Belt Applications

Photographs of line of V-belts in operation include scenes from equipment manufacturing plant, food processing, colloid mill, screw conveyor, jaw crusher, pug mill, hammer mill, power take-off, conveyor of a grain elevator and a portable washing plant. Gives application story along with the photo. Discusses features of the compact type belt including space, weight and cost savings. *Dodge Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 107

Adjustable V-Belt

Bulletin reports on a V-belt developed especially to handle big, heavy-duty horsepower drives efficiently. Discusses features of the patented adjustable V-belts; easy to couple and uncouple, strong and long-wearing. Pictures typical installation of the V-belt on a low pressure air compressor in a steel mill. Illustrates types available, how to install, how to measure. *Manheim Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 108

Timing Belt Drives

Sixty-seven page catalog describes line of timing belt drives for power transmission from subfractional horsepower uses to rugged industrial applications involving more than 600 hp. Discusses use for synchronizing two or more shafts and for functional applications to convey and control motions. Covers patented construction including an explanation of the tooth-grip principle. Illustrated, the book includes data on bushings, drive selection, horsepower capacity, how to specify, installation, pitches, selection procedure and sprocket diameters. *Morse Chain Co.*

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Positive Drive Belts

Brochure describes positive drive belts geared for perfect timing and bodied with steel cable for greater strength. Discusses features of the drive: smaller size, lighter weight, lighter bearings, less noise, simplified maintenance and greater precision. Lists belt details and specifications including positive drive stock sizes. *Goodyear Tire & Rubber Co., Industrial Products Div.*

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Lapless Belts for Power Transmission

An endless, lapless belt that features strength, uniform thickness, better pulley grip, minimum permanent stretch, smooth running and balanced construction is the subject of this bulletin. Discusses application in textile industry, metal and wood working, paper tubes, folding paper boxes and machinery builders' industries. Outlines necessary information for transmission and conveyor use and includes horsepower table. *Ton-Tex Corp.*

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Adjustable Speed Belting

Brochure describes a new speed belt that is detachable and adjustable for variable speed applications. Discusses advantages including die cut links, longitudinal flexibility, crosswise rigidity and quick assembly. Pictures the two types of belting available and visualizes instructions on fastening and unfastening. Outlines the advantage of the use of synthetic blended filament yarn in the making of the belt. *Brammer Corp.*

... FOR YOUR COPY, CIRCLE NO. 112

V-Belt Driven Design and Selection

This 180-page handbook along with a supplement containing new horsepower ratings contains the latest design data available to the industry. Its seven sections cover: development and application of V-belt drives; V-belt drives for standard motor speeds; supplementary drives; V-flat drives using existing flat pulleys; how to design V-belt drives; special design information and data on sizes, interchange, installation and maintenance. Includes examples of applications on various types of equipment to meet varying drive conditions. *Dayton Rubber Co.*

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Transmission Belting

Bulletin gives general information on transmission belting, a description of square edge type belting, folded edge type and endless belts. Discusses composition of a grade of belting material for very severe service at high speeds over relatively small pulleys; another grade for special operating conditions where oil and grease are encountered; a belting for severe flexing and resistance to shock loads; one for general industrial, commercial and agricultural applications and two others for endless farm belting. Includes complete data. *Thermoid Div., H. K. Porter Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 114

Variable Speed Belts

The principle of variable speed belt drives and three basic types of variable drives are the subject of this 32-page bulletin. These include the spring loaded, dual and countershaft dual variable pulleys. Table of contents includes features of the belts, standard cross-sections, applications, drive data and engineering data. *Durkee-Atwood Co.*

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Belts for Every Need

Brochure gives description and photo of a belt for sub-standard sheave diameters, high speeds, very short center distances, excessive oil, heat and static. Another belt is described as permitting a wide range of special drive designs, more power in less space, higher speeds, smooth and vibrationless. This is two of the six types of belts described and illustrated in this bulletin. *Dayton Industrial Products Co., Div. Dayton Rubber Co.*

... FOR YOUR COPY, CIRCLE NO. 116

Power Transmission Belting

The V-belt section of this catalog explains the essential differences in design and construction between V-belts with synthetic cord load carrying sections and steel cable load carrying sections. Discusses the adaptability of each type to shock loads, to long and short centers, to high and low-speed operation, and to widely varying ambient atmospheric conditions. Application photos show different types of belts in action. *Maurey Mfg. Corp.*

... FOR YOUR COPY, CIRCLE NO. 117

Link V-Belts

Three types of link V-belts are covered in this catalog: regular for general service, oil-proof for oily and high temperature drives and, static-conducting for explosive atmosphere drives. Lists 14 important advantages of the belts and construction, measuring and installation data. Photos illustrate installations of machine tool drives, line shaft drives, pump, compressor and generator drives, textile industry, marine drives, pulp and paper industry, brick, clay and stone products industries, needle trade and special applications. *Manheim Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 118

Smaller, Lighter V-Belt Drives

Manual introduces a new line of V-belt drives offering extreme compactness. Discusses features of the new line including strength factor of the smaller belt, smaller sheaves resulting in less cost, improved machine design and new mechanical advances. The 40-page bulletin describes and illustrates construction features of the belts and bushings. Also includes information on center distance, dynamic balance, installation, instructions for selection of drives, operation, service level, speeds, take-up allowances, tension of belts and tables on drive selection and horsepower for standard and special drives. *Dodge Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 119

Fairbanks No 1

a scale, our first one.
an imagination of iron, brass, copper and lead,
fashioned in a New England workshop.
inanimate.

but it spoke—
a different kind of language,
of pounds and ounces and fractions thereof
and it spoke only the truth.

it fell—
the roundness of grain, the smoothness of marble,
the sweetness of candy and the authority of gold.

it heard—
the sound of life, babies newborn
it cradled them and recorded their growth
until pounds and ounces were replaced
by years and months.

it traveled—
by packet boat down the Mississippi,
by clipper ship to England,
The Sandwich Isles, the Indies,
South America and China.
better known throughout the world
than anything else made in America.

it was relied on
by farmers, merchants,
scientists and doctors.
it witnessed history;
influenced it and was part of it.

its descendants have new names.
torsion dial, mercoid switch,
reed switch and cotton lap;
remote control,
printomatic,
electronic and levertronic.
all serve to evaluate and control
the substances that make up
the universe.

raw materials
or manufactured articles;
things unseen or man himself;
all have weight and must be measured . . .
our scales do the job.

and the new challenge—
weight in motion . . .
freight trains in transit,
trucks too busy to stop,
liquids coursing through miles of pipe . . .
our scales will do the job.

but this was our first—
Fairbanks No. 1
and we hold it in special reverence
for it weighed the most precious thing of all.
it weighed an idea.



Fairbanks, Morse

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Scales for heavy industry and for business; scales for science and for the home. Scales that weigh milligrams or millions of pounds. Scales that weigh missile fuel loads at Cape Canaveral; trucks on the Golden Gate Bridge; onions at your neighborhood grocer's . . . we make every kind of scale for every kind of purpose, including electronic scales. We are the Number 1 manufacturer of scales and automated weighing systems in the world.

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HELPFUL LITERATURE

FOR THE WEST'S PLANT OPERATING EXECUTIVES

FOR YOUR FREE COPY CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 53

CLAMPS FOR 58 PIPE SIZES

Booklet lists and pictures 58 different types of clamps for pipe sizes ranging from $\frac{3}{8}$ in. to 2 ins. Describes how almost any type of structure from the heaviest storage racks to light playground equipment can be designed around the line of fittings. Included are single socket tee, straight coupling and others. *WedgeLock Corp.*

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POLYESTER FILM FACTS

Booklet gives the properties and suggested uses of "Mylar" polyester film. Charts list physical, electrical and thermal properties and show resistances to a wide range of chemical attack. Illustrated text portrays 30 current applications of the material including electrical and packaging. *Cadillac Plastic & Chemical Co.*

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WIRE CLOTH FILTER ELEMENTS

Illustrated brochure covers typical fluids and systems that can use firm's line of Poromesh and Micromesh wire cloth filters. Details of design features, environments, construction, performance and metals for these wire cloth filters are also discussed. Lists design data requirements. *Bendix Filter Div., Bendix Aviation Corp.*

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A SYNTHETIC RUBBER SEALANT

Booklet gives full information about a polysulfide synthetic rubber sealant especially effective for use in curtain wall construction and on surfaces where adhesion is difficult. Lists advantages of the product, proven uses, directions for applications and mixing of the two component product. *A. C. Horn Companies Div. Sun Chemical Corp.*

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IMPROVED MOTOR COUPLINGS

Brochure describes three new features that have been added to line of geared flexible motor couplings. Discusses a new corrosive duty cover, a larger size addition and a new type of spacer adapter. Includes photos, drawings, information on selection as well as specifications and dimensions. *Link-Belt Co.*

... FOR YOUR COPY, CIRCLE NO. 154

INDUSTRIAL FURNACES

Brochure pictures 30 different furnaces for industrial applications such as a bath furnace, continuous galvanizing equipment and a vertical aluminum extrusion furnace. A chart shows heat treating processes and applicable furnace and protective atmosphere types. *Sunbeam Equipment Corp.*

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STEAM CLEANERS

A complete line of steam cleaners are illustrated and described in this bulletin. Includes details and specifications covering four basic models with capacities of 100, 200, 750 and 1500 gals. per hour of hot cleaning solution for all industries. *Vapor Heating Corp.*

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AC MAGNETIC STARTERS

Illustrated bulletin gives engineering data on line of enclosures, forms and combinations of starters for every industrial requirement. Discusses sturdy construction, simplicity of design and fast, easy maintenance. Fully describes and diagrams the arc quenching principle used on size 2, 3 and 4 starters. *Clark Controller Co.*

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CORROSION RESISTANCE GUIDE

Guide lists the relative ability of metals, plastics and synthetic rubbers used in the manufacture of Flo-Ball valves to resist the corrosive effects of 390 different fluids encountered in industry. An easy-to-read tabulation permits a rapid estimate of the effect of the fluids on selected materials of construction. *Hydromatics, Inc.*

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ROUND AND SQUARE TUBING

Round, square and rectangular tubing is covered in this 17-page stock list. Included are round carbon steel tubing, cylinder tubing, iron pipe sizes, square carbon steel tubing, rectangular carbon steel tubing and tolerances. The catalog also describes the advantages and applications of structural steel tubing. *Foucar, Ray & Simon, Inc.*

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NEW CONDENSER TUBE ALLOY

A mercury inhibited brass condenser and heat exchanger tube alloy, the first known to incorporate mercury as an inhibitor, is introduced in this brochure. Discusses uses of the new alloy, outstanding features, installation, field and service experiences, including a comparison of the alloy with other condenser tube alloys. *Bridgeport Brass Co.*

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Quick, Efficient push-button Storage Control



This Chainveyor Power & Free application creates controlled storage during assembly of components at I.T.E. Circuit Breaker, Philadelphia, and at the same time clears critical work areas for increased efficiency.

Partially assembled components are hung on carriers at a powered load station. Loaded carriers are then automatically directed into any one of eight different assembly and storage cycles from a push-button control panel.

Power & Free combinations of this type are ideally suited for controlled storage and conservation of valuable floor space. Utilization of free gravity flow in conjunction with powered track opens infinite opportunity for efficient, lower cost materials handling.

Write for Chainveyor's Planning Folder which includes illustrated catalogs, explanatory diagrams, plant and conveyor planning grids for preliminary layouts.



QUALITY
OVERHEAD
CONVEYOR
SYSTEMS

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CORPORATION *Engineers & Manufacturers*

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LITERATURE ADVERTISED IN THIS ISSUE

Foundry machinery, complete line, mixers, furnaces, screens. *Fernholz Machinery Co.*

Page 72 Circle No. 52

Western packaging Exposition, July 19-21, tickets. *Clapp & Poliak Inc.*

Page 21 Circle No. 16

Wire packaged in coils for continuous operations. *Colorado Fuel & Iron.*

Page 79 Circle No. 61

Compressed air systems, portable or stationary. *Compressor Service Co.*

Page 77 Circle No. 57

Steelflex couplings protect against shaft misalignment. *Falk Corp.*

Page 13 Circle No. 9

Sturdi-Bilt pallet racker enables palletizing up to 12,000 lbs. per stack. *Union Asbestos & Rubber Co.*

Page 63 Circle No. 42

Sling chain selection, care, use and inspection. *Columbus McKinnon Chain.*

Page 50 Circle No. 27

Cranes engineered for each particular job. *Harnischfeger Corp.*

Page 19 Circle No. 15

Lubriplate data book on lubricating all types machinery. *Lubriplate Div., Fiske Brothers Refining Co.*

Page 70 Circle No. 50

Fencing for durability and maximum protection. *Anchor Fence, Div. Anchor Post Products Inc.*

Page 14 Circle No. 10

Electric trucks in 2,000 to 3,000 lb. capacity for delicate maneuvering. *Yale Materials Handling Div., Yale & Towne Mfg. Co.*

Page 6 & 7 Circle No. 4

Special alloy sand and centrifugal castings. *Ampco Metal, Inc.*

Page 17 Circle No. 14

Firehose, lightweight, neoprene covered for plant protection. *Goodall Rubber Co.*

Page 50 Circle No. 26

Damp-proof red primer, free test sample to apply over sound rusted surface. *Rust-Oleum Corp.*

Page 11 Circle No. 8

Roller chains catalog, 100 pages technical data. *Acme Chain Corp.*

Page 16 Circle No. 12

Stainless steel flexible connectors. *Universal Metal Hose Co.*

Page 58 Circle No. 34

Rotary union, a free-floating, long-lasting rotating seal. *Perfecting Service Co.*

Page 62 Circle No. 39

Hoists, balanced design for heavy lifting. *Harnischfeger Corp.*

Page 20 Circle No. 17

Couplers, idea booklets on use of steel strapping. *Acme Steel Co., Acme Steel Products Div.*

Page 61 Circle No. 38

Payloader tractor-shovels easily adjust to plant changes. *Frank G. Hough Co.*

Page 73 Circle No. 54

Motor-mounted pumps for compact, lightweight units. *Viking Pump Co.*

Page 64 Circle No. 44

Wrench, two sizes on each, designed for safety. *Snap-on Tools Corp.*

Page 71 Circle No. 51

High-strength steel, technical brochure, full data. *Ducommun Metals & Supply Co.*

Cover 3 Circle No. 67

OIL, AIR-HARDENING TOOL STEEL

Illustrated booklet on oil-and air-hardening tool steel covers four high-alloyed grades of tool steel. Discusses uses, characteristics, advantages, typical analysis and heat treatment. Instruction for working the four high-alloy grades are fully illustrated and described. *Bethlehem Steel Co., Pacific Coast Div.*

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TUBE FITTINGS

New 44-page catalog contains technical data and full description of line of butt-joint tube fittings. Includes over 250 styles and sizes and contains vital data for engineers connected with tube circuitry. Also includes information on brazed-seal fittings for extra high pressure and temperature. *Imperial Brass Mfg. Co.*

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BRONZE PRODUCTS

Useful information for bearing users is contained in this brochure which describes a line of bronze products, manufacturing and service facilities. The brochure includes a picture-story layout of how the bronze products are made, research facilities and engineering services. *Johnson Bronze Co.*

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PACKING, SHIPPING EFFICIENCY

One hundred ways to save money in packing, shipping, and stockroom operations are listed in this informational guide for plant and warehouse superintendents, purchasing agents, and stockroom supervisors. The booklet has valuable pointers on equipment, employee, and administrative problems. *Manpower, Inc.*

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SPECIAL HYDRAULIC PRESSES

Brochure covers specially designed and manufactured presses of all types for manufacturers in every industry. These presses include special designs for the assembly of electric motor stators and rotors, varying in sizes up to 150 tons in capacity for the larger size motors. *St. Lawrence Hydraulic Co.*

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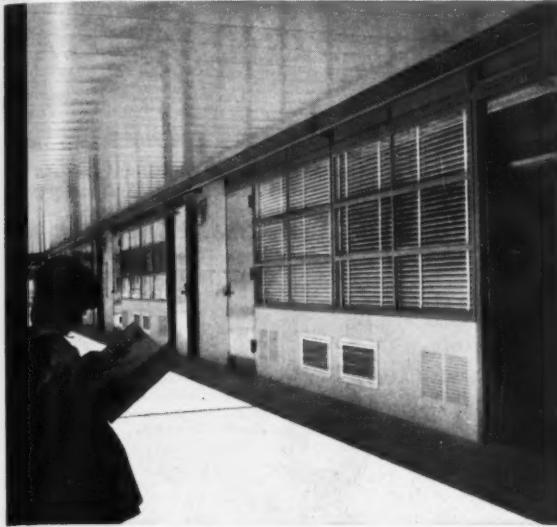
INDUSTRIAL CHEMICALS

Brochure lists 78 chemicals for industrial, laboratory and agricultural uses, giving price and shipping data. Included are acetone, acids, alcohol, algae and scale controls for cooling towers, weed and brush killers, ceramic colors, creosote, potassiums, sodiuns, sulfur, wax and many others. *Los Angeles Chemical Co.*

... FOR YOUR COPY, CIRCLE NO. 166

New Western ideas in steel

Architect: Roy Donley & Associates



Steel Goes to the Head of the Class as school building material. In Canoga Park, Calif., one shining example is Justice Street School. Styled in steel with a weather-proof roof, a student-proof frame and whisper-proof walls. USS Steel in roof decking, structurals and wall panels locks together for life-long dependability in this fire- and earthquake-safe school by Calcor Corp., of Huntington Park, California.

Contractor: Whelan Construction Co.



Spacious Beauty with Ribs of Steel. Enter the Whelan Building in Palo Alto, Calif., and you sense a new spaciousness—born of steel. The frame, with welded beams of USS Steel, went up in four days! Result: the whole job finished faster. Steel framing means movable partitions inside for more flexible office planning. Architect: Knorr-Elliott Associates, San Francisco. Steelwork: Schrader Iron Works, San Francisco.

Lightens your work

Brightens your leisure

Widens your world



Businessmen, school officials and home planners: before you build, consider the design, space- and cost-saving advantages of steel construction. Your architect, working with qualified structural engineers and fabricators, can bring you all these benefits and more when you build with steel!

STEEL FOR EVERY PURPOSE FROM A SINGLE SOURCE

Contractor: Robert Jolly Construction Co.



Take to the Hills with Steel and make the most of a difficult site! Rigid frames of USS Structurals anchor this house and a viewtiful deck to an ageless foundation designed by nature. The architect, Thorne of Berkeley, planted the house in a cluster of boulders—but left them undisturbed in the wooded Sierra foothills. Steelwork, like this by Pittsburgh Des-Moines Steel Co., Fresno, Calif., goes up in a day!

Architect: Donald Francis Haines & Associates



City Hallmark in Steel Design. The distinctive face of this gracefully curved City Hall in San Jose, Calif., is all steel and glass. For lasting beauty, porcelain-enamelled curtain walls of USS Steel are available in a variety of colors, to brighten the life of any building for decades! Curtain walls: Michel & Pfeffer, Inc., South San Francisco. Contractor: Carl N. Swenson Co., Inc., San Jose, Calif.



Columbia-Geneva Steel
Division of
United States Steel

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- 4—Extremely flexible . . . easy to handle.
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300 LB. TEST



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the sling chain with everything

- high resistance to impact loading
- maximum safety for overhead lifting
- lighter weight for easier handling
- long life on toughest jobs

FIRST TO BE TESTED, REGISTERED AND GUARANTEED. A Certificate of test including guarantee is issued for each new Herc-Alloy Sling Chain shipped from our factory. A metal registration tag is permanently attached bearing the serial number which is recorded in our engineering files with full details about your chain.



FIRST CHOICE WITH EXPERIENCED CHAIN BUYERS SINCE 1933

Herc-Alloy is the original alloy steel chain...is heat treated by a special process...is electrically welded by exclusive Inswell time-tested method. All attachments are alloy steel including those to your specifications which are forged in our own shop. Specify Herc-Alloy for the best of everything in sling chains.

CHAIN SAFETY PROGRAM literature and assistance available.



SEND FOR
helpful Data Book on
Herc-Alloy
sling chain
selection,
care, use and
inspection.

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Herc-Alloy® CM®



... for more details, circle No. 27
WESTERN INDUSTRY/MAY 1960

POWER TOOLS, ACCESSORIES

New catalog of line power tools and accessories contains illustrations and specifications of saw blades and wheels; drills and power units; snap lock tools; drill accessories for sanding and polishing; for drilling, driving and paint stirring; for buffing, grinding and wire brushing; belt sanders, routers and router bits. *Skil Corp.*

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AIRCRAFT LOCKNUTS

A high-strength aircraft locknut rated at 260,000 pounds per square inch tensile strength is described in this bulletin. Photos, charts and line drawings point up design and performance features of the 12-point self-locking nut. Discusses weight savings, strength features and locking performance. *Standard Pressed Steel Co.*

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SPRAY DRYING

Bulletin highlights the research, engineering, testing and custom drying facilities available to industry for spray drying. Illustrates four different size spray dryers in operation as well as an analytical lab for on-the-spot analysis and evaluation of raw materials and finished products. *Nerco-Niro Spray Dryer Div., Nichols Engineering & Research Corp.*

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DIE HANDLING VEHICLES

A comprehensive analysis of line of industrial trucks for die handling covers four basic types: push-pull type, side and end-loading type, winch type, and the new fifth wheel type. Describes features of the trucks. Platform specifications, truck heights, weight and turning space are charted in the illustrated folder. *Elwell-Parker Electric Co.*

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GAS TURBINE POWER

New dimensions in lightweight gas turbine power are set forth in this bulletin. Introduces family of 75 hp. to 20,000 hp. ultra-lightweight, compact gas turbines designed for a wide variety of applications including fluid and gas pumping, electric power generation, and marine vehicular propulsion. Covers design features. *General Electric Co.*

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MATERIAL HANDLING EXAMPLE

Case history of how a printing company successfully utilized the inherent operating features of both hand and powered equipment to keep pace with an expansion program that doubled the size of their building and increased their work load to 16 hours a day. The illustrated bulletin describes all phases of the operation. *Lewis Shepard*

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PLUNGER-TYPE TOGGLE CLAMPS

Three new models of plunger-type toggle clamps are depicted in this bulletin. Included are a small clamp series with a 95 lb. holding pressure and a medium-duty clamp with a rated holding pressure of 450 lbs. Features, specifications and full-size tracing templates are also included in the bulletin. *Detroit Stamping Co.*

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THE COST OF NOISE

Users and manufacturers of machine tool equipment can reduce machine shop noise 83 to 88% and completely eliminate bar stock damage, according to this case study. Explains how this can be done by using new polyvinyl chloride rigid plastic tubes to line or replace metal tubes on automatic and hand screw machines, and on turret and engine lathes. *A. M. Byers Co.*

... FOR YOUR COPY, CIRCLE NO. 174

EXTRUDED STEEL SHAPES

Booklet contains a wide variety of information, photos and schematics describing some unusual aspects of extruding steel and stainless steel. Includes photos of 38 different shapes produced under a patented process. A standard design guide points out important factors to consider in designing the shapes. Includes handy glossary. *H. M. Harper Co.*

... FOR YOUR COPY, CIRCLE NO. 175

SCREW FASTENING OF ALUMINUM

Technical handbook on the various types of standard and special fasteners and fastening systems used to join aluminum assemblies. The 48-page book is supplemented by 38 illustrations, 12 tables, including list of special screw fasteners and recommended hole sizes for various types of self-tapping screws in sheet aluminum and other materials. *Reynolds Metals Co.*

... FOR YOUR COPY, CIRCLE NO. 176

MECHANICAL FEED DRILL

Brochure introduces a new line of feed drills for producing clean, precisely-located holes. Designed for drilling alloys, variable set ups, gang and precision drilling, the brochure discusses five points of superiority, describes operation of the drill, fastening the drill to templates and sets forth full specification data. *Ingersoll-Rand.*

... FOR YOUR COPY, CIRCLE NO. 177

SWITCH-CIRCUIT ASSEMBLIES

Bulletin describes a series of synchronized one-shot switch-circuit assemblies for use in pulse and digital systems. Includes photos, schematic diagram of circuit, graphs of typical output pulses, mounting dimensions, detailed application information and possible variations. *Micro Switch, Div. Minneapolis-Honeywell Regulator Co.*

... FOR YOUR COPY, CIRCLE NO. 178

CONVEYOR TRANSFERS

Forty-two ways to transfer materials on conveyor systems are outlined in this collection of technical papers. Each method is illustrated and described to point up the principle employed and to suggest possible types of applications. Typical transfers illustrated involve gravity to gravity, gravity to power, power to gravity. *Rapids-Standard Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 179

ANNULAR FORM GRINDER

A machine for grinding annular forms and grooves in workpieces up to 10 inches in diameter and 24 inches between centers is described in this catalog. The illustrated booklet covers grinding methods, grinding features and machine features, condensed specifications, and typical grinding applications. *Sheffield Corp., a sub. Bendix Aviation Corp.*

... FOR YOUR COPY, CIRCLE NO. 180

3-WAY VALVES

Bulletin describes in detail line of full capacity series, 3-way valves for air, oil, water, gas, chemical or vacuum service. Illustrated with photos and schematics, the booklet covers specifications, outstanding features and dimensions. Includes direct and pilot solenoid operated; mechanical and manual; pilot operated and time delay. *Airmatic Valve, Inc.*

... FOR YOUR COPY, CIRCLE NO. 181

SMALL BORING MACHINES

Two small precision boring machines, a single-end and a double-end model, are described and illustrated in this folder. The machines are particularly suitable for boring small holes at close center distances. Bulletin illustrates various spindle setups and items of equipment available to add to the productivity and versatility of these machines. Includes a floor plan and specifications. *Ex-Cell-O Corp.*

... FOR YOUR COPY, CIRCLE NO. 182

WATERSTOP TECHNICAL MANUAL

Sizes and shapes of the waterstop, comparative data for rubber and plastic waterstops, and handling and storage of the material are among the subjects discussed in this comprehensive design manual. Includes design data for little and considerable movement joints, application data for the installation of waterstop and how to splice this material in five minutes. Contains 51 drawings and photos. *Gates Rubber Co., Industrial Div.*

... FOR YOUR COPY, CIRCLE NO. 183

LOW-VOLTAGE EQUIPMENT

This 84-page catalog covers low-voltage distribution equipment. It includes service entrance equipment, light and heavy duty safety switches, tumbler and open-knife switches, hinged wireway, circuit breakers, switchboards, motor control centers, sectional distribution centers, and all types of panelboards and busway. There are selector charts for each type of product, and pictorial descriptions. Contains ratings, weights, dimensions, and general application data. *General Electric Co.*

... FOR YOUR COPY, CIRCLE NO. 184

UNIT AIR FILTERS

Bulletin describes construction and application of permanent washable unit air filters. Explains advantage of high capacity, low resistance unit; heavy-duty metal filter; aluminum filter and spray booth filter. Discusses filter maintenance methods, equipment necessary, together with installation data. *American Filter Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 185

UNITIZED BROACHING FIXTURES

Two-color catalog describes line of unitized broaching fixtures. Included are a variety of self-contained, air-powered broaching fixtures for producing keyways, slots, flats, small splines, oil grooves, serrations, deburred surfaces and holes of various shapes. Typical applications are shown by an array of photos, line drawings and idea sketches. Complete production data is included for each application. *National Broach & Machine Co.*

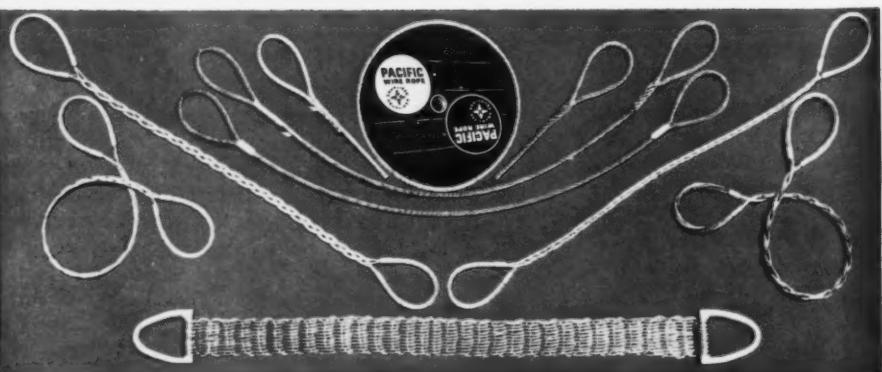
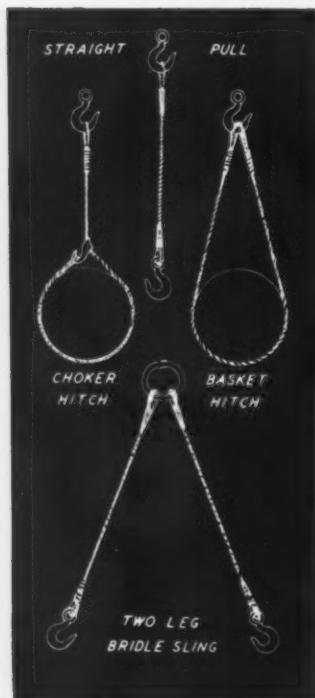
... FOR YOUR COPY, CIRCLE NO. 186

COMPUTER CONTROL BASICS

This booklet, "A Return to Sanity in Computer Control," cuts through the confusion surrounding the subject of process computer control. It takes the reader from the initial feasibility study stage through the individually justified intermediate steps, to the completion of a fully automated control system composed of standard building block components. *Beckman Scientific and Process Instruments Div.*

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Only Pacific Wire Rope slings are "Equalized"—giving added flexibility. Maximum strength right from the start—removes initial stretch, back twist and tendency to kink—compacts rope, resists bridging, strand nicking and crushing caused by sharp edges and right-angle bends. Complete range of sizes and types of splice for use in or out of plant.

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FELT AS A DESIGN MATERIAL

Booklet to help engineers get the most out of felt and felt products. Includes data on design properties of felt, descriptions of special treatments, and how to select the proper shapes and dimensions for specific applications. Covers felt for lubrication seals, gaskets, wicking and filters. Describes SAE types and recommendations. *The Felters Co.*

... FOR YOUR COPY, CIRCLE NO. 188

FINE WIRE PACKAGING GUIDE

Easy-to-read guide designed to show packaging possibilities for stainless steel and nickel alloy fine wire requirements. Data is presented by grouping the various alloys and breaking these groups down into size ranges. The information then refers to the put-ups in which this material is available. *H. K. Porter Co., Inc., Riverside-Alloy Metal Div.*

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HARDNESS CONVERSION

This chart shows the approximate relation between hardness by various systems and tensile strength of carbon and alloy steels. The hardness systems covered are Brinell, Monotron, Vickers, Rockwell and Scleroscope. Chart is based on data from Westinghouse, Bureau of Standards, and ASM. *Babcock & Wilcox Co., Tubular Products Div.*

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COATED GENERATOR BRUSH

Bulletin illustrates and describes how newly introduced coated equal-load brush reduces commutator wear and threading on any low-voltage DC generator commutator to a minimum by assuring that brushes carry equal current loads. Discusses operation, construction and five features of the generator brush. *Hanson-Van Winkle-Munning Co.*

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CENTRIFUGAL, TURBINE PUMPS

Bulletin illustrates and describes centrifugal and turbine type pumps: single and multiple stage, flexible and close coupled, horizontal and vertical. Covers design features, typical applications, capacity and head range for each type pump: turbine, non-clog, split case, sump, end suction and condensate return units. *Aurora Pump Div., New York Air Brake Co.*

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VACUUM METALLIZING COATINGS

Comprehensive 45-page booklet describes in detail the application and use of vacuum metallizing coatings which may be applied by spraying, dipping and flow coating to thermoplastics, thermosetting plastics, metals and glass. Base coats for use before metallizing as well as top coats and back up coats for use after metallizing are discussed. *Bee Chemical Co., Logo Div.*

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ELECTRIC FORK TRUCK

Brochure describes a new electric fork truck with step-less speed control. The unique speed control is available on models in 4, 5, 6 and 7,000 lb. capacities. Discusses safety features of the speed control as well as stress reduction on driving members and elimination of wasted current. Illustrates heavy load applications on ramps or when stacking at high elevation. *Perin Co., Inc.*

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MONTGOMERY BROTHERS, INC.

ENGINEERING DEPT.

FIELD REPORT No. 1

CLIENT: Western Piping and Engineering Co., Inc., San Francisco

PRODUCT: Chromalox Tubular Heaters



MB

REPRESENTS

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Commercial Filters Corp.

Sta-Warm Co.

Kanthal Corp.

Sauereisen Cements Co.

Ark-les Switch Corp.

Aquamatic Valve, Inc.

Cox and Co., Inc.

MB Chromalox Heating System Gives Clean Accurate Heat

An electric heating system was selected for these two autoclaves recently engineered and fabricated by Western Piping and Engineering Co., Inc., San Francisco, for a large West Coast pipe manufacturer.

The autoclaves, capable of heat-treating pipe to lengths of 50 feet, and to 18-inch diameters, are heated by Chromalox tubular elements strapped to their surfaces.

By selecting Chromalox electric heating, the customer achieved a cleaner and more compact installation and better temperature control as compared with conventional steam installations. Initial cost was reduced by eliminating the need for steam jackets, boilers, valves, piping, pumps, and condensers.

Montgomery Brothers, Inc., who represent Edwin L. Wiegand Company, manufacturers of Chromalox Tubular Heaters, engineered the heating requirements. They can serve you, too. Whether you manufacture autoclaves, or any other product requiring electric heating, call your nearest Montgomery Brothers office for a visit from an experienced sales engineer.

He can help you engineer an electric heating application, or his company can fabricate a complete system for you.

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SILICONES AND THEIR USES

A guide prepared for design engineers and production-maintenance men summarizes the forms, properties and applications of silicones. The silicone products reviewed range from adhesives to release agents, laminating resins to rubber compounds, and electrical insulation to water repellents. Reports resistance to time, heat, moisture, weathering, oxidation and chemical attack. *Dow Corning Corp.*

... FOR YOUR COPY, CIRCLE NO. 195

NONFERROUS SPECIFICATIONS

A detailed chart showing comparative specifications, chemical analyses and minimum physical properties of a line of nonferrous alloys. Also describes component parts and assemblies regularly produced by the centrifugal method. Each of the alloys, plus a current comparison between Federal, Military, SAE and ASTM specifications, is included. *Centrifugally Cast Products Div., Shenango Furnace Co.*

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BEARING UNITS

Catalog covers complete line of bearing units including load rating and comparison charts. Selection covers high or low series ball bearing pillow blocks, lubricated for life or relube type bearings, ball or tapered roller bearings, two or four hole flange blocks, eccentric locking or setscrew locking and side mounted or protected screw type take-ups. *Browning Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 197

PSYCHROMETRIC CHART

New edition of psychrometric chart now goes to 350 deg. F. dry bulb temperature. An explanation of the use of the chart points out that any two known properties of an air and water vapor mixture establish a point on the chart, which may be used to determine other characteristics of the mixture. *J. O. Ross Engineering, Div. Midland-Ross Corp.*

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STAINLESS STEEL WIRE

Manual contains technical and practical information including data on the chemical analysis and mechanical properties of all grades of stainless steel used in wire, and recommendations for the application of representative grades in about 400 environments. A section outlines uses of stainless steel wire. *Stainless and Strip Div., Jones & Laughlin Steel Corp.*

... FOR YOUR COPY, CIRCLE NO. 199

THERMOCOUPLE ASSEMBLIES

Forty page catalog describes over 100 complete thermocouple assemblies in detail, including photos, specifications and dimensions. Covers general purpose assemblies including straight, angle, high-speed, spring-loaded and new high-temperature assemblies. Also special use assemblies for metals, food and glass industries. *Minneapolis Honeywell Regulator Co., Industrial Div.*

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HIGH SPEED FORMING MACHINES

Special products catalog describes and illustrates three new high speed forming machines. Examples of parts produced are illustrated along with production, tooling and material savings information. Catalog also describes complete plant facilities for special machining and parts manufacture. *Cyril Bath Co.*

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PACIFIC

Features

PUMPS FOR INDUSTRY

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WET PIT TYPE SINGLE PUMP UNIT WITH SUMP COVER DUPLEX, DRY PIT & HORIZONTAL TYPES AVAILABLE

THOUSANDS OF PACIFIC NON-CLOG pump installations handle industrial wastes, heavy fluids, liquids containing solids, refuse and pulp. Available in special metals for handling products of canneries, breweries, food, and other processing plants. Send for Bulletins 1850 series.

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WIDE RANGE OF SIZES AND TYPES conform to latest ASVE recommendations, for vertical, elevated or floor level installation. ReturnZall package units (illustrated) are complete package units, with square cast-iron receiver, bronze fitted centrifugal pumps (type GR), standard heavy-duty NEMA motor and float controls. For complete information send for Series 1700 bulletins.

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AUTOMATIC DRAIN TRAP

An automatic drain trap is among units described in this bulletin covering a complete line of air control devices. Applicable for use on all types of compressed air installations, the bulletin includes a description of the automatic discharge of condensate and oil as it is collected and other outstanding features of the lightweight drain trap. *Perfecting Service Co.*

... FOR YOUR COPY, CIRCLE NO. 202

AIR-COOLED TORQUE CONVERTER

Folder describes new air-cooled torque converter for use with engines in the 10 to 50 hp. class. Discusses applications such as small road rollers and construction machines, agricultural equipment and industrial power transmission. Specifications include a typical performance curve and dimensioned exterior drawings. *Clark Equipment Co.*

... FOR YOUR COPY, CIRCLE NO. 203

SEMICONDUCTOR PRODUCTS

Brochure covers complete line of industrial semiconductors including germanium industrial power transistors, audio and switching transistors, Mesa transistors, silicon rectifiers and silicon zener diodes. Lists major specifications such as breakdown voltages, current capacity and operating temperature ranges. *Motorola, Inc., Semiconductor Products Div.*

... FOR YOUR COPY, CIRCLE NO. 204

RELAYS FOR ALL APPLICATIONS

Publication discusses complete line of relays for any application including general purpose, machine tool, mechanically held or latched-in, pneumatic time-delay and synchronous motor-driven timing. Illustrated, the brochure contains relay descriptions and application and installation details. Dimensions and ratings are also included. *General Electric Co.*

... FOR YOUR COPY, CIRCLE NO. 205

VALVE CATALOG

Booklet covers line of bronze, iron and forged steel gate valves; bronze and iron check valves; asbestos packed iron cocks; bar stock valves; valve parts; steel and forged valve accessories; and cast steel valves. Includes operating specifications, and complete data. *R-P&C Valve Div., American Chain & Cable Co., Inc.*

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NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 53, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

UNION BONNET BRONZE GATE VALVE

... for application in the 125 to 150 psi steam-pressure range

The combination of three design elements: union bonnet, reinforced body, and cylindrical body neck section, makes this new series safe and maintenance-free for industrial piping and valving systems. A plus feature is the chamfered opening inside the top of the body, providing more working room for positioning the discs on the guide when assembling the valve.

Long pipe threads in the body permit tight valve-to-pipe jointing, without risk of pipe crowding and distorting the valve discs. The gate valve pictured, (1) has double wedge disc and rising stem. To provide even greater application latitude for this type valve (2) the solid wedge disc and rising stem valve has been introduced along with (3) a single wedge disc and non-rising stem type. *Lunkenheimer Co.*



... FOR MORE DETAILS, CIRCLE NO. 250

HYDRAULIC GEAR PUMPS

... simplified design, longer life, higher performance

The design of this new family of hydraulic gear pumps is a refinement and extension of the press re-loading principle originated and patented by the maker. Construction permits pressure from the outlet port to be diverted behind the rear bearings to reduce clearance between bearing faces and gears for optimum volumetric efficiency at all speeds and pressures. Other features are special alloy tin-aluminum bearings of the type used in the heaviest-duty industrial engines, double lip shaft seal, hardened and ground steel gears and shafts, and high tensile aluminum bodies. A wide variety of porting, mounting and drive arrangements are offered. The line consists of five series of pumps with four displacement variations in each series, all available with either side or end porting or a combination of these, and with standard SAE mounting flanges and drive shafts. *Borg-Warner Corp., Wooster Div.*

... FOR MORE DETAILS, CIRCLE NO. 251

HEAVY-DUTY PLATFORM TRUCKS

... in 1000 lb and 1200 lb capacities, 10 different sizes

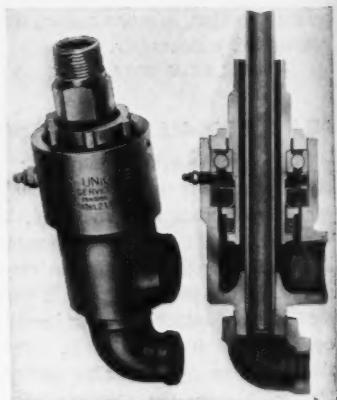
A new heavy-duty series of platform trucks featuring universal caster mounting plates and safety tread plate decks are an addition to company's line of general purpose 4-wheel floor trucks for material handling in plant and warehouse. New design features include: universal caster mounting plates permitting use of a wide variety of commercial or industrial running gear arrangements; deeper, heavier channel sections with smooth outer surface and rounded corners for mounting full perimeter rubber bumper; deeper handle sockets set into heavier channels that combine with reinforced corners and riveted deck and mounting plates to form a rugged corner assembly. Sizes range from 24 by 36 ins. to 36 by 72 ins. *Magline, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 252

A ROTARY UNION

... that automatically adjusts to pressure

This newly developed rotary union, a revolving sealing connection between a stationary supply pipe and revolving machine cylinder, roll, or drum, has low friction, mechanical seal and ball bearing construction which decrease wear and power consumption. Precision mechanical sealing is accomplished by two parallel optically flat lapped surfaces running together in an opposite plane in relation to the axis of the shaft. Another feature is the new mechanical seal designed so that pressure is automatically increased or decreased in proportion to the fluid pressure of the application. Free floating action and ball bearing construction prevents unnecessary strain and wear on the sealing surfaces which eliminate maintenance and extends the life of the seal. Designed to handle steam, water, air, vacuum, industrial fluids and gases on applications up to 250 psi, 150 psi steam, and temperatures to 500 deg. F without any adjustments. *Perfecting Service Co.*



... FOR MORE DETAILS, CIRCLE NO. 253



Two Anaconda Plants to serve the Growing Industrial West

Early last year, the Anaconda Wire & Cable Company added a new facility at Redwood City, California, (Sequoia Wire and Cable Company) for production of a line of wire and cable to meet the special requirements of the fast-moving electronics industry.

Anaconda has long been a partner to the growing, dynamic West and has been proud to have been part of this growth. For over thirty years, the Orange, California, plant has exerted every effort to better serve its utilities, industries, railroads and other customers in the manner expected by these fast-growing customers.

In addition to complete stocks and technical services located at these two plants, the research and engineering facilities and the varied manufacturing skills of the nationwide Anaconda Wire & Cable Company are available to

—and stand behind—the Orange and Redwood City, California, plants. Anaconda is proud to be part of the growing industrial west.

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STEEL SERVICE COUNTERS

... heavy-duty, boltless, T-line shelves available in six colors

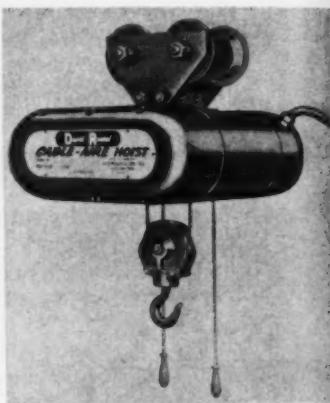
New heavy-duty steel service counters feature ease of assembly resulting from unique boltless construction. Known as T-line steel service counters, the units have wide application in stores, warehouses, factory storerooms and supply houses. Constructed of standard components, including posts, shelves, counter fronts and partitions, open or closed styles are available with or without doors. Reinforcements can be added where loading is extremely heavy. Accessory parts such as dividers and drawers can be added to the under-counter storage bins and any number of sections can be joined together to form a long, continuous counter. The basic element of the T-line counters is a new two-part channel clip. *Alan Wood Steel Co. Penco Div.*

... FOR MORE DETAILS, CIRCLE NO. 254

CABLE TYPE AIR HOIST

... compact design achieves closest headroom

Hoisting close to overhead supports, close approach to walls and building structures in load handling is possible with this cable type air hoist which adapts compactness of construction to design. Powered by rotary vane, explosion-proof air motor, and with complete protection against burnout from overload,



the hoist meets all requirements for operation in hazardous atmosphere. Control valve automatically returns to neutral upon release of rope pendant. Upper limit safety also returns control valve to neutral. Standard lifts of 20 and 40 ft. with variable speeds are offered in capacities from $\frac{1}{4}$ to 2 tons. A three-reduction spur gear mechanism with large contact-area mechanical load brake is permanently lubricated and housed in a high strength aluminum alloy frame. One-piece steel lug suspension members connects to plain, hand geared or air driven trolley. *David Round & Son, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 255

MORE MOTOR FRAME SIZES

... design improvements include conduit box versatility

An extension in frame sizes to provide a complete line of Kinematic industrial motors, generators and motor-generator sets includes four NEMA frame sizes, 584A, 585A, 683A and 684A, and results in 28 new drip-proof motor ratings and 14 new drip-proof generator ratings. The increased versatility of the line, now extended to the larger frame sizes, provides a wider range of applications on machine tool and printing press drives, as well as in the steel, rubber, paper, lumber and textile industries. Design improvements include integral cast main field coil and pole assembly providing greater protection and improved heat transfer. Easier maintenance is offered since the complete pole and coil assembly can be replaced as a single unit. *General Electric Co.*

... FOR MORE DETAILS, CIRCLE NO. 256

HOW TO COPE WITH A COUPLER



These AAR Standard E-60 couplers used to be a king-size shipping problem. Previously, they were loaded singly, by overhead crane, in gondola cars—unloaded painstakingly the same way.

Now, with Acme Steel Strapping, couplers are palletized in lots of six. Loading and unloading are faster, and easier. Storage is simpler, requires less space. Inventory problems have been eased.

There's a good chance that Acme Steel Strapping can profitably solve a materials handling challenge for you. Let your experienced Acme Idea Man study your problem. Or, for more facts, mail the coupon.

**ACME
STEEL**

**IDEA LEADER IN
STRAPPING**

... for more details, circle No. 35 on Reader Service Postcard

At National Malleable & Steel Castings Co., Acme Idea Man Gene Fairbank views Idea No. U6-36 which he helped develop.

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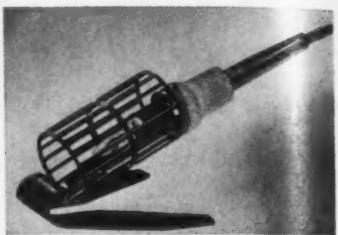
SOLDERING IRON HOLDER

... for versatile use, with unique safety guard design

A significant feature of this new soldering iron holder is the exclusive safety guard design which fully protects the operator against painful hot tip burns, thus eliminating the fear of accidentally

brushing against exposed hot irons. The holder keeps the soldering iron cradled safely and securely in one convenient place, increasing soldering efficiency and providing greater protection against iron breakage. The apparatus may be attached to the top of the bench, to a wall or side of the bench, or to the underside of the bench. Also, the operator can adjust the angle of the holder, so that the soldering iron is positioned for easy, instant use. *Ungar Electric Tools, Electronic Div. Eldon Industries, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 257



PALLETS WITH PAINTED ENDS

... acts as sealant, represents grade of lumber used

A program involving the end painting of all lumber used in newly constructed pallets has been announced by this maker of wooden pallets. Two improvements, in addition to enhanced appearance; the paint acts as a sealant for the ends of the boards, helping to prevent drying and subsequent cracking of the lumber, an important factor in pallet life. Two different colors are used to represent the various grades of lumber used in pallet construction such as green for standard grade and blue for select grades. *Select Pallet Co.*

... FOR MORE DETAILS, CIRCLE NO. 258

ALL-PLASTIC VACUUM BREAKER

... for prevention of backflow in high-purity piping systems

This first all-plastic vacuum breaker is injection-molded UPVC (unplasticized polyvinyl chloride). Manufactured in $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ in. nominal pipe sizes, it makes available the corrosion-resistant, non-contaminating properties of UPVC for backflow prevention in water supply, pharmaceutical process lines, chemical and lab piping and sanitary plumbing. The new vacuum breaker incorporates an all-plastic movable disc, wholly within the unit, which moves up to close air vents and permit free flow of liquid through the device, then seats itself in a vacuum-tight seal to prevent back siphonage when the flow stops. A removable cap protects air vents against exterior fouling. Designed to meet state and municipal plumbing code requirements. *Tube Turns Plastics, Inc.*



... FOR MORE DETAILS, CIRCLE NO. 259

FIRE RETARDANT MATERIAL

... developed for printed circuits, panel boards

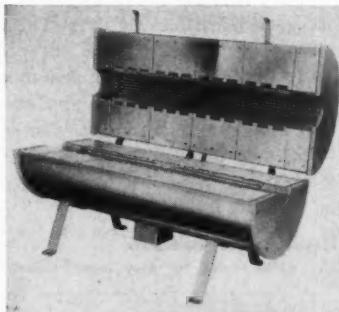
An easily fabricated plastic laminate has been developed to reduce fire hazards in printed circuit applications. The new material, a paper-base phenolic laminate, is designed to replace more expensive epoxy paper laminates now being used. The first paper base phenolic laminate to combine flame retardance with good cold punching characteristics, it is of prime interest to computer and panel board manufacturers as well as manufacturers of radio and television sets. The new material meets the standards for grades established by the NEMA and UL tests for flame resistance. It is available in two copper-clad forms: a foil copper-clad laminate for radio and TV use, and a copper-clad laminate for computer printed circuits, panel boards, and military applications requiring plating from alkali solutions. *National Vulcanized Fibre Co.*

... FOR MORE DETAILS, CIRCLE NO. 260

COMBUSTION TUBE FURNACES

... capable of operating at temperatures of 2200 deg. F

A complete new line of furnaces built for 2200 deg. F operation feature vestibules on each end of the heating chamber to reduce heat losses and effectively extend the length of the uniform hot zone. Heat source is a helical coil, high temperature alloy



heating element mounted in semi-cylindrical refractories of the multiple unit design. These heating units can be arranged for multiple zone temperature control to provide optimum temperature uniformity over an extended length. The manufacturer has also expanded the variety of sizes in its 1850 deg. F combustion tube furnace line. Furnaces in both temperature ranges are available in either solid or hinged construction, with or without indicating or controller pyrometers. *Hevi-Duty Electric Co.*

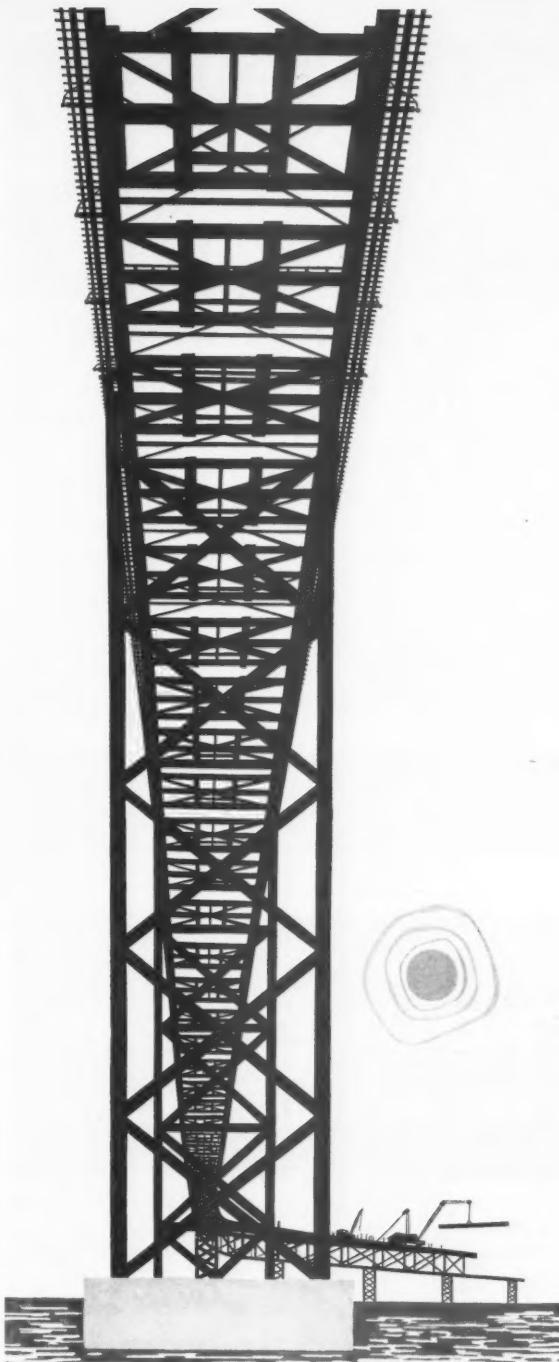
... FOR MORE DETAILS, CIRCLE NO. 261

VIBRATION TRANSMISSIBILITY RECORDER

... for use by research and testing laboratories

A new instrument now makes possible significant advances in recording vibration transmissibilities or other two-signal ratios. It permits continuous, direct recording of vibration transmissibilities with greater speed and accuracy than previous point-by-point manual methods, recording transmissibility direction as a function of frequency and giving a ready-to-use curve. The instrument can be used to determine these ratios (1) input voltages vs frequency, (2) time-integral of input voltages vs frequency, (3) time-derivative of input voltages vs frequency. It features four operating scale ranges, high resolution capabilities, a built-in operating check and continuously adjustable sensitivity. Data is recorded by ink writing in permanent, easy-to-read chart form. *Lord Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 262



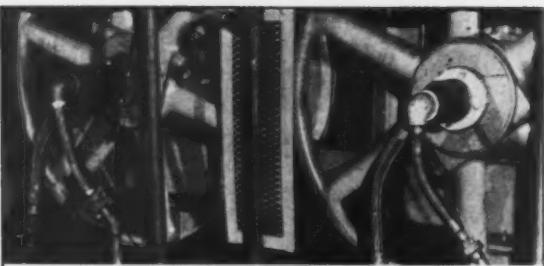
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SOCKET SCREWS

... with new self-locking insert of a nylon type polymer

A new line of socket screws made with a new nylon type polymer insert will solve many problems where vibration is a major factor. The new line performs over a wide range of temperatures. In aircraft and missile application it has proven its ability to withstand impact, shock and the most rugged of environmental conditions. In industrial use in automotive components and assemblies, appliances, engine, tools and heavy machinery, the new screws will achieve superior thread engagement, high torsional resistance and a self-locking drag. The design of the fastener is such that the insert does not protrude and thus passes easily through all normal clearance holes. It holds its grip even in unusually adverse applications where frequent adjustment is a requirement, eliminates the need for lock washers of intricate safety wiring. *Parker-Kalon*.

... FOR MORE DETAILS, CIRCLE NO. 263

HACK SAW BLADES

... color coded for easy identification

A new color coding process for packaging power and hand hack saw blades has been introduced to eliminate waste motion. Five different type blades are packaged in colored boxes: Duraflex hand hack blades are green in color and packaged in corresponding green boxes; high speed steel power and hand hack blades are gray and housed in gray boxes; super safe hand hack blades are tangerine and packaged in tangerine boxes; Di-Mol hand and machine blades are black and housed in black boxes; Chromol hand hack blades are packaged in buff colored cartons. The boxes can be stacked in shelves according to color, thus enabling quick selection as well as a more accurate inventory control. *H. K. Porter Co., Inc., Disston Div.*

... FOR MORE DETAILS, CIRCLE NO. 264

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ALATHANE WHEELS

... for rugged applications, extreme resistance to abrasives

Wheels and casters of alathane, an extremely tough synthetic urethane elastomer, have a loading range of semi-steel, resist a permanent "set" under static loads and are impervious to practically all chemicals and solvents. The wheels are liquid cast directly upon concentric, machine faced steel hubs to form wheels that withstand shock, impact, capacity loading and even abnormal abuse. Easily maneuvered, they eliminate replacements and reduce maintenance. Capacities range from 800 to 8200 lbs. with diameters from 6 to 12 ins. Tensile strength is approximately 5000 psi, and operational temperatures from minus 40 to plus 200 deg. F. *Stanley E. Morris Co.*

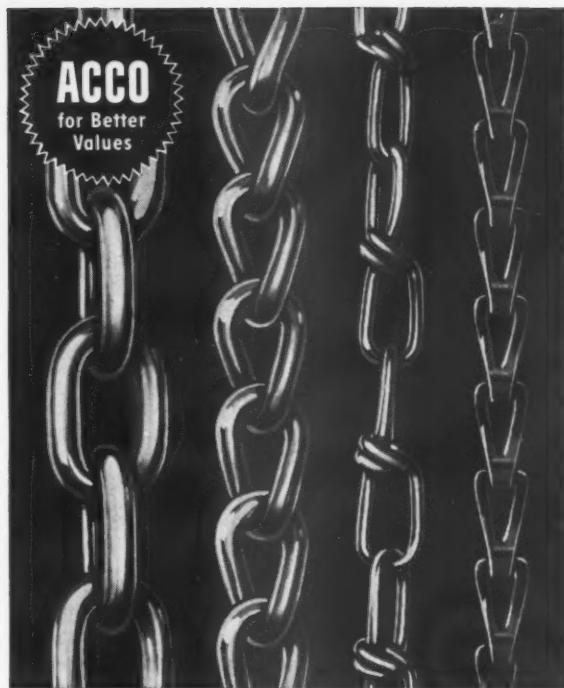
... FOR MORE DETAILS, CIRCLE NO. 265

TRUCK SELECTOR

... for automatic truck systems requiring less than six stations

A newly designed radio frequency selector for automatic truck systems is primarily designed for the in-the-floor truck installations requiring less than six transfer points or loading and unloading stations. By setting a dial the selector will, through the use of low frequency radio signals, both route a truck and announce its arrival at a predetermined transfer point or loading station. Employees who may be working in bin areas away from station or transfer points can be alerted to the truck's approach. The radio frequencies can be used to activate warning bells, buzzers or lights. The selector can easily be removed and replaced as desired. *Jervis B. Webb Co.*

... FOR MORE DETAILS, CIRCLE NO. 266



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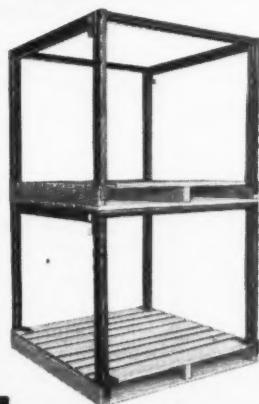
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Sturdi-Bilt

Material Handling Div. (WI-50)
Union Asbestos & Rubber Co.
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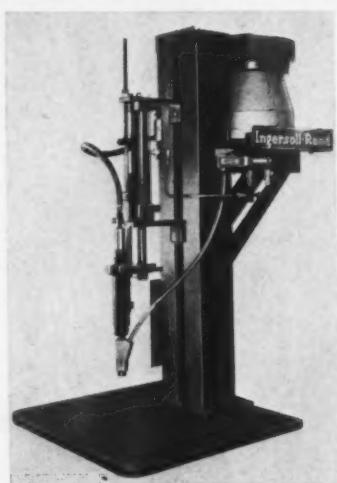
Without cost or obligation, please send me full details on the new STURDI-BILT Pallet Racker.

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WESTERN INDUSTRY/MAY 1960

AUTOMATIC SCREW DRIVER

... versatile design permits rapid pattern changeover

Screw patterns can be quickly changed on this newly developed rapid automatic fastening screw driver by loosening and tightening only two bolts per powerhead. It drives practically any number of screws in practically any production pattern to meet the demands of the fastest assembly lines. The driver runs screws in 1½ seconds. Three different power ranges are provided by three different multi-vane air motors for precise predetermined torque control. In each power range, the motors run to stall, driving screws to a preset, accurate torque. Powerheads can be located as closely as 2 ins. center-to-center and can be added or removed easily. Most all common screw types can be used on the standard screw drivers while special hard-to-feed screws can be handled with minor adaptations in many cases. *Ingersoll-Rand Co.*



... FOR MORE DETAILS, CIRCLE NO. 257

RESIN ADHESIVES

... expand easy-cleaning, multi-purpose line

The Solu-Rez series of multi-purpose polyvinyl acetate resin adhesives has been expanded to include three viscosities: 220, 1500, and 2000 cps. Applicable for carton sealing and folding box manufacture, the series features excellent machining on most high-speed carton sealing and forming equipment and easy washability of machine parts and reservoir. The adhesives offer excellent mileage because of high solids content and products in the series undergo no significant viscosity changes under constant agitation. The adhesive produces strong bonds on a wide range of different types of carton surfaces and is especially useful on the newer difficult bonding boards, particularly those with hard finishes for better printing surfaces. *Morningstar-Paisley, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 268

STEM THERMOMETER

... six foot stem for measuring liquids and gases in deep vats

Accurate measuring of temperatures in deep vats, kettles, tanks, stacks, ovens, ducts and other vessels is possible with this new giant stem stainless steel thermometer. All units are ruggedly engineered to withstand pressures up to 3475 psi. Hand calibrated for accuracies within one per cent of the full scale reading, the thermometers are available in temperature ranges from 0-200 deg. F to 200-1000 deg. F. Also supplied in centigrade calibrations. A large 5 in. dial makes reading easy and positive; also comes in smaller dial sizes. *W. C. Dillon & Co., Inc.*

... FOR MORE DETAILS, CIRCLE NO. 269

SMALL CAPACITY

Viking Compact Motor-Mounted

PUMPS



This new line of Viking "656" motor-mounted pumps is expressly developed to meet the demand for compact, light weight and integrally mounted units. They're designed for pressure lubrication, filtration, circulation, transferring of liquids up to 7500 S.S.U. and 500 P.S.I. All have the famous Viking "gear-within-a-gear" pumping principle.

- Steel fitted, bronze fitted, all bronze.
- Mechanical seals or conventional packing.
- Single phase 1750 R.P.M. motors—open or explosion proof—1/4, 1/6, 1/2 or 3/4 H.P.
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For more complete information, write for bulletin
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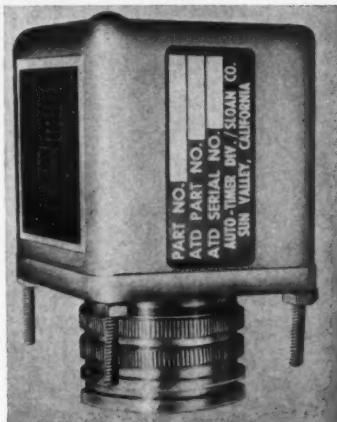
... for more details, circle No. 45

TRANSISTOR TIME DELAY RELAY

... for delayed switching and high current applications

New model transistor time delay relays consist of a transistor time delay circuit, operating two DPDT relays. The time delay can be adjusted over a range of 10 per cent above and below normal. The delay range is from 10 to 250 seconds. Operating on 18 to 32 volts with a control voltage of 28 volts DC, positive, the new relays are used in military and commercial aircraft to operate fuel flow and hydraulic valves, and for instrumentation switching of computers, programmers and high speed cameras. Industrial applications include control of semi-automated machines and equipment. The relays have an overall accuracy of 2 per cent, will withstand shock of 100 plus or minus 5G, one-half sine wave, 2 to 10 milliseconds duration, and vibration of 10G from 5 to 2000 cps. *Auto-Timer Div., Sloan Co.*

... FOR MORE DETAILS, CIRCLE NO. 270



ACOUSTICAL CEILING TILE

... with unusual washability, high light reflection

This plastic-covered, acoustical ceiling tile is integrally pigmented for permanent bright-whiteness and high light reflection. It need never be repainted, thus providing maintenance economy. An incombustible mineral fiber material, it is especially useful for areas with high cleanliness requirements, such as rooms containing delicate machinery or office equipment. It may be washed as often as desired and is completely non-dusting. The delicately textured pattern embossed on the tile blends well with any decor. Efficient sound-absorbing properties result from vibration of the vinyl plastic facing and the transfer of these vibrations to a mineral fiber core. The tile may be applied by adhesive or a concealed suspension system. *Celotex Corp.*

... FOR MORE DETAILS, CIRCLE NO. 271

SELF-PROPELLED TRACKLESS CARRIAGE

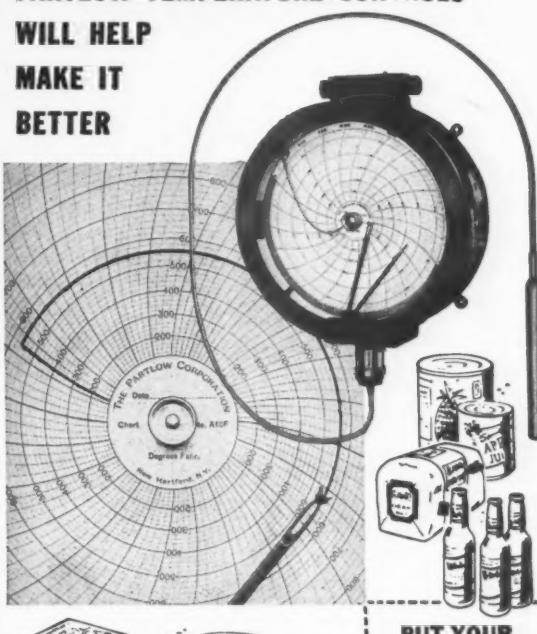
... for operation with mechanized squirt welder

Designed to produce long welds continuously, thereby increasing operating factor, this 37 lb. compact tractor requires no supporting fixtures. The equipment can be easily moved to the job site and quickly placed in operation thus eliminating the time loss and cost of moving bulky assemblies to fixtured welding equipment. Applicable in structural fabricating, shipbuilding and machinery manufacture where long welds are involved in the manufacture of the product. The carriage travels on a pair of magnetized rollers. The rollers prevent slipping and bouncing and yet move the trackless carriage at speeds ranging from 7 to 70 ins. per minute. The magnetic force is great enough to support the weight of the unit, the welding gun, and cable assembly, for out-of-position welding. *Lincoln Electric Co.*

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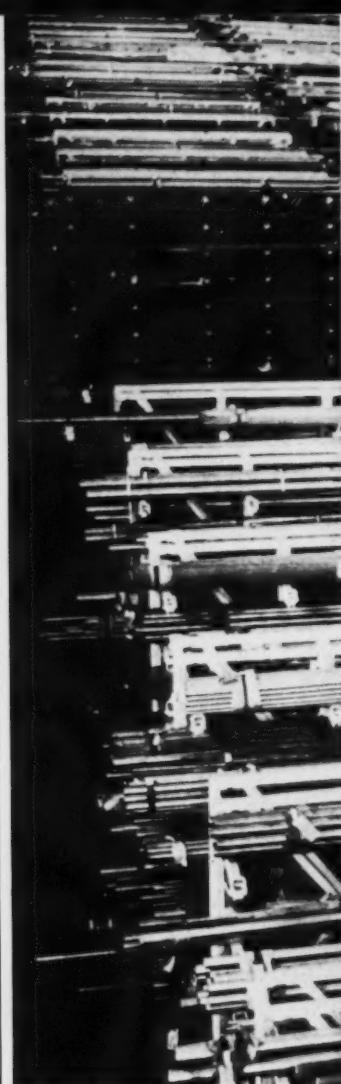
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SHEET



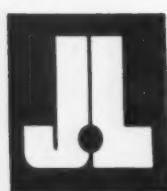
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WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS • PRODUCTION • DISTRIBUTION • PERSONNEL

So. Cal. Edison May Build Atomic Plant

LOS ANGELES—Construction of the nation's largest atomic electric power plant may be started next year by Southern California Edison Co.

Following a recent meeting of the company's board of directors, *Harold Quinton*, chairman, said that a letter of intent to negotiate contracts for the design and construction of a 360,000 kilowatt atomic power plant has been sent to the Westinghouse Electric Corp. and to the Bechtel Corp.

The contemplated plant employs the world's largest atomic power reactor. It would be designed and built by Westinghouse, who also would supply the steam and electrical equipment. The over-all plant cost is estimated at approximately \$70,000,000. Bechtel Corp. would be the engineering constructors.

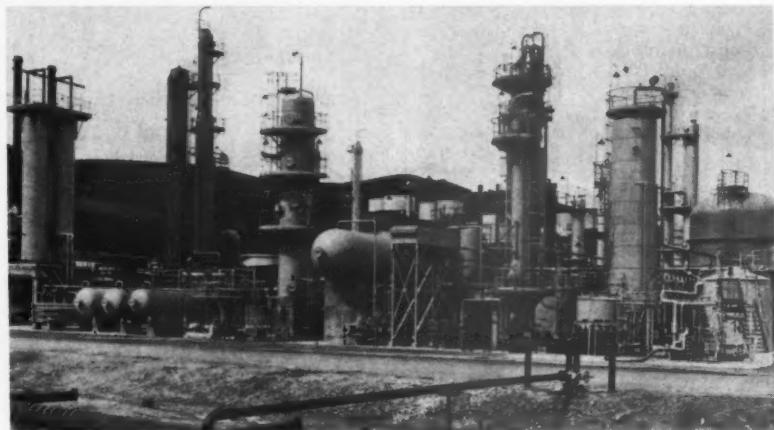
According to present estimates, such a plant would require about 4 years to construct.

Pacific Pumps Receive A Cup for Safety



Sweepstakes award for the best overall National Safety Council safety record for the Southern California area went to Pacific Pumps, Inc., Div. Dresser Industries. Presenting the award is John Vivyan, CBS TV actor, as the recipient, A. R. Weis, president of Pacific Pumps, center, and J. T. Blaylock, president of the Los Angeles Chapter, National Safety Council looks on.

Oronite's New Multi-Million Dollar Facility



RICHMOND, CALIF.—Oronite Chemical Co., a subsidiary of the Standard Oil Co. of California, started full-scale production last month of an improved detergent alkylate from its newly completed plant here.

The plant will produce detergent polymer, using a new process developed by Oronite's research affiliate

California Research Corp. The polymer will be processed into detergent alkylate and then will be sold as a base material for detergents.

Oronite reports that the new material, which will be marketed as Alkane "60," will boost a detergent's foaming and cleaning power and also cut production costs.

Harvey Aluminum Inc. Announces Expansion

TORRANCE, CALIF.—The Harvey Aluminum Inc., here, has announced that it is expanding its aluminum reduction capacity by 25 per cent and making substantial additions to its fabricating facilities.

Its reduction plant, located at The Dalles, Oregon, last year produced about 58,000 tons of primary aluminum. The fabricating plant here makes a broad range of basic mill aluminum products, and titanium and zirconium products.

The new fabricating facilities consist of billet casting, wire rod and related facilities being constructed at The Dalles, and a merchant bar mill and conduit facilities being constructed at its fabricating plant here.

FM&C Build Research Center at San Jose

SAN FRANCISCO—Construction will begin about July 1 on the first phase of a new research center by Food Machinery & Chemical Corp.'s Central Engineering Laboratories, according to *James M. Hait*, FM&C executive vice president. The new center will be located in Santa Clara, adjacent to the present FM&C facilities at San Jose, Calif.

Hait said the initial phase of more than 40,000 sq. ft. will house mechanical, electronic, physics and materials processing laboratories, as well as engineering and administrative offices. It will accommodate approximately 300 engineers, scientists, technicians and supporting personnel.

GEARS FOR INDUSTRY
THE **Lufkin LINE**
OIL FIELD PUMPING UNITS

Did You Know . . .

that, the town of Lufkin, Texas, besides being world famous for coon hunting, and cooking, southern style, is also the home of Lufkin Gears for Industry, Oil-field Pumping Units, and Heavy Duty Truck Trailers?

that, the town is nestled among the tall pine trees of East Texas, where forests thrive and grow 5 times faster than in other parts of the U.S.? Heavy rainfall and warm temperatures make it so.

that, the great southern paper industry utilizing southern pine, long leaf and loblolly pine, began in Lufkin, Texas—home of the Southland Paper Mills, back in 1937? E. L. Kurth, Board Chairman of Lufkin Foundry and Machine, is President of Southland, and to Mr. Kurth goes the credit for pioneering this vast industry from its infancy. Modestly, however, he would be the last to claim such recognition.

that, Lufkin Oilfield Pumping Units have earned worldwide recognition for performance, dependability, and long life?

that, Lufkin Gears for Industry are fast gaining prominence in the fields of refining, pipelining, marine propulsion, aircraft ground support, and yes, even outer space?

But it's not all sweatin' and straining at Lufkin—the folks there are easy goin' and find time to go cat fishing, coon hunting, squirrel and crap shooting, and sometimes, go in for just plain loafing.



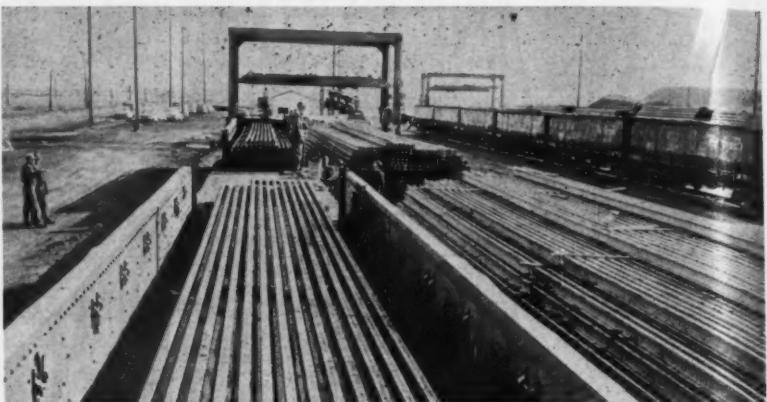
V. J. Fawcett

V. J. Fawcett
Lufkin FOUNDRY
& MACHINE COMPANY

... for more details, circle No. 48

68

Western Produced Rail Enroute to Mexico



PUEBLO, COLO.—Here is part of first shipment of welded rail from the U.S. outside the country. One hundred sections, 78 ft. long and weighing slightly more than a ton, were welded by the National Cylinder Gas Div. of Chemetron Corp., at a plant adjacent to Colorado Fuel & Iron Corp.'s mill here, where the 39-foot lengths were produced, then shipped to Mexico. Sixteen thousand welded rails have been ordered for a new rail line through Mexico's Sierra Madre mountains.

The double-length rails ride in "pairs" of cars, one gondola and one flat car in each pair. This is the first shipment loaded in this manner to be accepted for interchange between line-haul carriers.

RCA Opens \$10 Million Electronics Facility

VAN NUYS, CALIF.—Radio Corp. of America recently dedicated its \$10,000,000 electronics center here at 8500 Balboa Blvd. Among officials attending the opening were Maj. Gen. W. O. Senter, U.S. Air Force; Dr. Vern O. Knudsen, UCLA chancellor; John L. Burns, RCA president; and Dr. E. W. Engstrom, RCA vice president.

The six buildings making up the new center are now the factories producing electronic equipment including check-out and launch control systems for the Atlas ICBM and the auto pilot for Thor IRBM.

Discussing peaceful applications of some phases of military electronics, President Burns visualized an electronic traffic-solving device in which master computers would sift traffic-flow data and each driver would carry a device tied into it by radio which would tell the driver the most expeditious freeway route to take to his destination.

"The savings to the motorist and his family in terms of time, calmer nerves, fewer ulcers and fewer charred dinners could be incalculable," Burns commented.

Find Large Reserve Asbestos Ore in West

NAPA, CALIF.—Establishment of the largest reserves of asbestos ore in the U. S. was announced recently by John H. Lowell, president of the Clute Corp.

A geological survey just completed at the ABC mine near here disclosed 3,942,000 tons of proved asbestos ore, 7 million tons probable and 200 million tons of possible ore reserves.

This more than doubles the reserves established on the property six months ago. The only other commercial asbestos in the U. S. is located in Vermont, with a limited tonnage of known reserves.

"Location of the Napa deposit is most significant," stated Lowell, "because of the tremendous advantage in freight to Western manufacturers of asbestos products. All major asbestos producing mines in No. America are located in eastern Canada. The U. S. has developed the greatest asbestos products industry in the world. Yet we are overwhelmingly dependent on importing 90 to 95 per cent of our raw asbestos."

Construction of a new 1,000 ton a day Clute mill is in progress at the mine site, with first major production of asbestos fiber expected in August.

Houghton & Company Opens New Facility

SAN FRANCISCO — To handle its increasing West Coast business, E. F. Houghton & Co. has opened a new plant at 54 Tanforan Ave., South San Francisco. The new facility is located on a three-acre plot and includes 30,000 sq. ft. of manufacturing space, a new office building, control laboratory and 10,000 sq. ft. of outdoor storage area.

Industrial oils and chemicals formerly manufactured at the company's plant here at 1500 Davidson Ave., are now being supplied from the new facility. Newly installed equipment includes provision for sulphonation, saponification, compounding, esterification and condensed reaction. Capacity has been increased more than 50 per cent over the former plant.

Houghton serves West Coast industry from Southern California where it maintains a warehouse in Los Angeles. *John Bermingham* is Western sales manager.

Metalworking items and functional fluids such as cutting and quenching oils, rust preventives, metal cleaners, specialty lubricants, hydraulic fluids and packings are included in the product line.

Disston Names Two Western Sales Reps

SAN FRANCISCO — The Disston Div. of the H. K. Porter Co., Inc., has appointed *Paul E. Forbes* to cover the Division's San Francisco, Nevada and Utah territory with headquarters here, according to a company announcement.

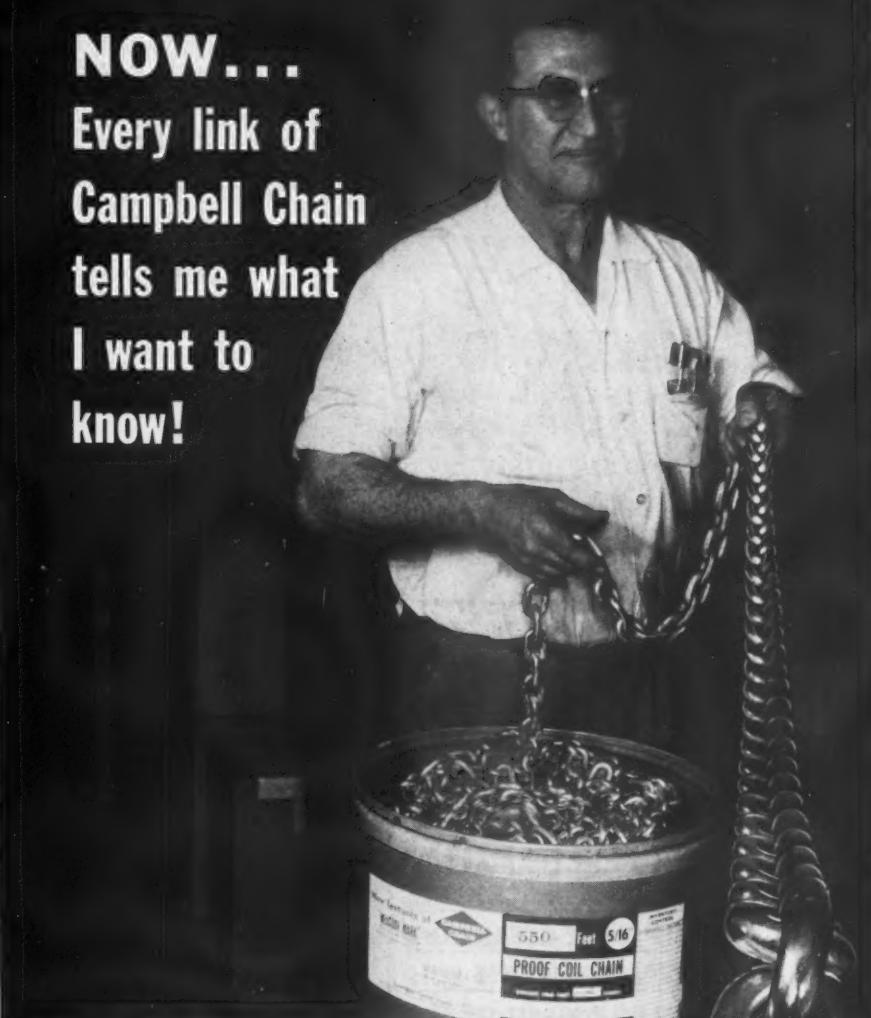
At the same time *Robert Palmer* was assigned to the Washington district sales office with headquarters at Seattle. Palmer will cover the California and Oregon area.

Disston manufactures a complete line of saws and cutting tools for lumber and metal working industries, as well as hand and power tools.

National Astro Labs Expands Facilities

PASADENA, CALIF. — Mike Rothbart, president of National Astro Laboratories, has announced expansion into larger quarters. The new facilities are located at 380 North Halstead St., here.

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... for more details, circle No. 50

70

Western Gear Acquires Everett Shipyard



EVERETT, WASH. — Major manufacturing facilities of a mothballed U. S. Navy shipyard here have been acquired by Western Gear Corp., Lynnwood, Calif., for expanding and moving its industrial products division, now located in the path of the Seattle-Tacoma Freeway. Maritime deck ma-

chinery will be produced in the new plant, which will be modernized at a cost of \$500,000. Dry docks, wharves, and water frontage of the yard were acquired by Pacific Tow Boat Co. of Everett, while another section of the 72-acre site was purchased by Scott Paper Co.

California Shows Sharp Rise During 1959 in Manufacturing Employment

SAN FRANCISCO—Employment in California's manufacturing establishments rose by 6 per cent during 1959 compared with a 4.5 per cent rise for the entire nation, according to an annual review of economic conditions in 1959 recently released by the California State Chamber of Commerce.

At the same time the California Dept. of Finance forecast that personal income of residents of the state will total \$42.3 billion in 1960 or 6.1 per cent greater than in 1959. It is expected that personal incomes of the US will increase in 1960 by 5.6 per cent to \$401.2 billion.

Most industry lines in the state showed increases ranging from moderate to heavy, the largest increase, 36 per cent, was in ordnance. Other substantial increases were registered by electrical equipment, instruments, motor vehicles and leather goods. Only two reported declines, shipbuilding, 3.6 per cent, and petroleum refining, 1.2 per cent.

The review pointed out that the measure of the State's recent rapid industrialization is found in the rise in employment during the past decade from 701,500 in 1949 to the total of 1,283,700 in 1959, or by 83 per cent.

This contrasts with a 14 per cent rise for the nation.

California had many well developed non-durable goods industries by 1949 and the over-all increase in these up to 1959 was only 30.1 per cent. However, two lines within this major grouping, paper products and rubber products, each more than doubled.

There was a sensational rise in the durables from 378,400 to 863,200 or by 128.1 per cent. Although a large part of this has resulted from the national defense program, as is true in most highly industrialized areas, tremendous increases have occurred also in industry lines not primarily dependent upon government contracts.

Mineral production, the review pointed out, is the only major segment of the State's economy which has not shared in this long term rise in activity.

Gilmore Corp. Purchases Vancouver, Wash., Shipyard

SEATTLE — The Vancouver, Wash., shipyard has been sold to the Gilmore Corp. of Portland, Ore., according to Clarence Morse, maritime administrator. Sale price was \$3,279,000.

Cutler-Hammer Plans Facility at Belmont

BELMONT, CALIF.—Plans for the construction of a new plant here to house the manufacturing, sales office and warehouse activities of Cutler-Hammer Inc., have been announced by Philip Ryan, president of the Milwaukee, Wisc. firm.

Ryan stated that the new plant will replace the outgrown manufacturing and office space in San Francisco and a warehouse in San Jose, California. Consolidation of these facilities will result in more efficient operations and will provide expanded service, he said.

The plant, to contain over 35,000 sq. ft. of floor space, will be located in a newly developed industrial area here, two blocks off the Bayshore Freeway and approximately 20 miles south of San Francisco. The electrical firm's present San Francisco employees will staff the new facility.

The plant will produce motor control lines and power distribution equipment and will be similar in size and operations to the firm's Los Angeles plant. Completion is expected by late fall. Kaiser Engineers are the plant designers.

New Headquarters For Tri-State Supply Corp.

SEATTLE—Wayne C. Groshart, vice president and general manager of Tri-State Supply Corp., here, has announced the official moving of the firm to new headquarters at 325 Westlake Avenue North.

The new quarters consist of complete offices and warehouse with loading facilities both in front and rear. Tri-State handles electric motor parts, electrical-electronic insulation; wire and equipment.

Ry-Lite Concrete To Build at Woodland

SACRAMENTO, CALIF.—George Bishop, president and general manager of Ry-Lite Concrete Products Co., here, has announced plans to build a plant in the Woodland, Calif., area.

The company is negotiating for property and could be in production 60 days after a site is bought. Bishop said the firm would hire about 100 persons and expects to manufacture about 20 concrete products within 18 months.

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Snap-on double hex openings are machined to close tolerances to fit snugly without slipping.

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Thin walls permit wrench head to reach into tight places.

6 MULTI-USE

Two sizes on each wrench.

7 COMFORTABLE

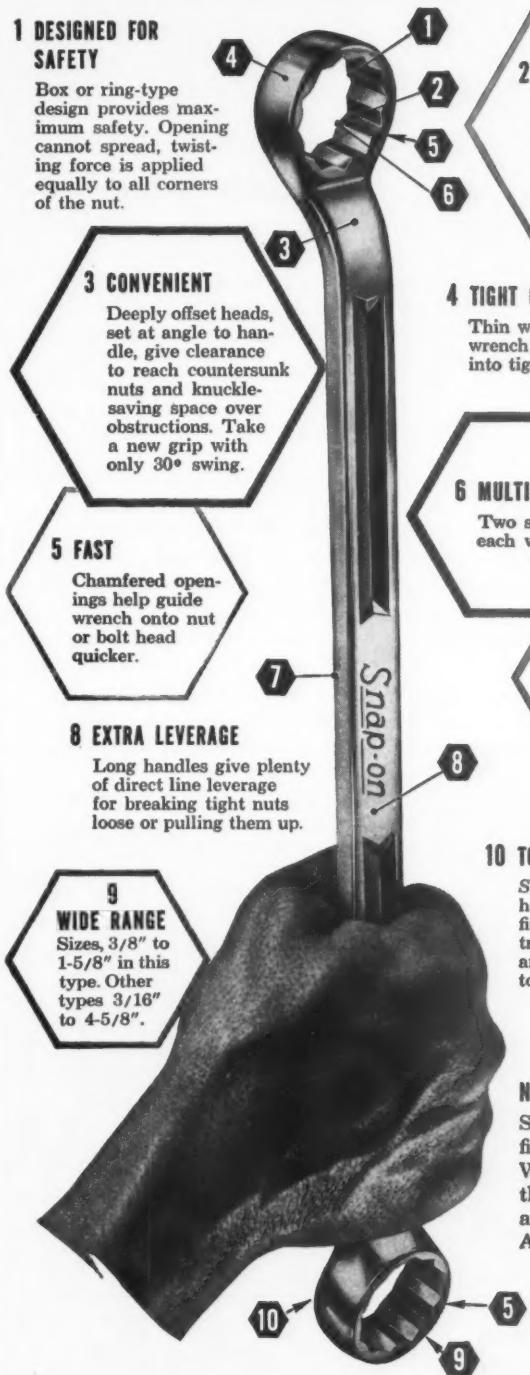
Rounded handle edges are easy on the hands.

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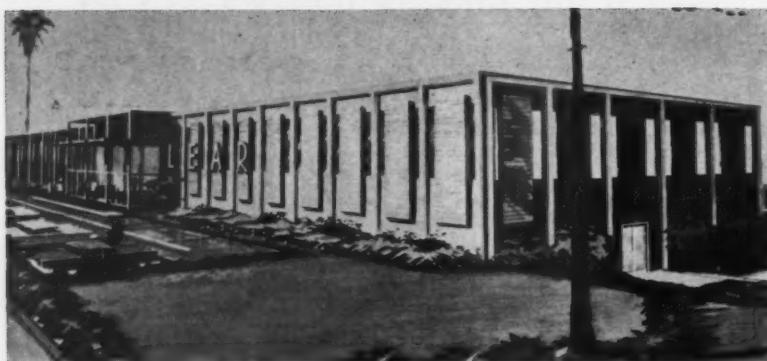


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New Executive Quarters For Lear, Inc.



SANTA MONICA, CALIF.—Lear, Inc. will erect a two-story 30,000 sq. ft. building here to house its corporate executive offices, it was announced recently by *A. G. Handschumacher*, president. The glass and masonry structure, of contemporary design, will cost about \$550,000. Sheldon L. Pollack and Assoc. are the builders.

The new building is adjacent to Lear's Astronics Div. plant on Santa Monica Airport. The schedule calls for occupancy about October 1. Handschumacher said that the company's facilities have increased nearly 40% in the last year. Lear also has California plants and offices in Los Angeles, Ontario, San Diego, Palo Alto.

Select Pallet Appointed Rep for Arkansas Firm

LOS ANGELES—The Select Pallet Co., here, has been named exclusive Southern California representative of the Arkansas Pallet Co. of Pinebluff, Ark. The appointment was made at the recent annual meeting of the National Wooden Pallet Manufacturers Association.

Reno Steel & Supply New Wholesale Firm

RENO, NEV.—Reno Steel & Supply Co., Inc., new wholesale firm, has been opened at 2300 Valley Road, headed by *Don Morgan*, formerly of San Francisco and Oakland.

Warehouse manager is *A. A. Villa-neuva*. Sales manager is *Edward C. Robinson*.

1,400,000 Safe Manhours At National Supply Co.

TORRANCE, CALIF.—The National Supply Co. plant here has qualified for two additional safety awards.

For the second successive year, the plant has earned the Award of Honor of the National Safety Council. The plant also won first place in the Steel Fabricating Div. of the Business and Industry Safety Contest sponsored by the Greater Los Angeles Chapter of the National Safety Council.

The Award of Honor is based on the plant's achievement of working 1,400,000 manhours throughout the entire year of 1959 without a single lost-time accident.

New Wood Products Company at Fresno

FRESNO, CALIF.—*C. C. Mosley*, Beverly Hills, Calif., has opened a new plant here at 740 No. Maple which utilizes waste products.

There will be a direct conveyor system from General Box Co. to transport the waste material to the new plant for processing into three grades of wood flour, the product will be shipped to the San Francisco Bay Area and Los Angeles to be used for plastics and roofing felt.

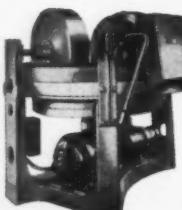
The facility represents an investment of \$100,000 and will be managed by *D. J. Cates*.

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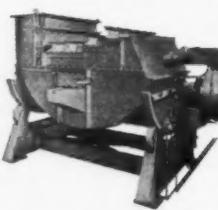
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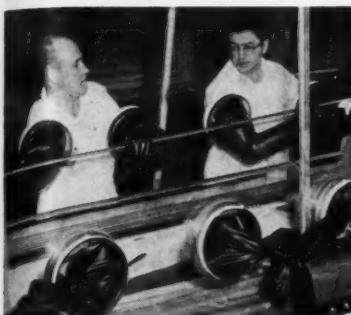
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Milestone for Plutonium Recycle Program



Pictured above cleaning one of the rods in preparation for canning in Zirconium alloy tubes are two General Electric engineering assistants, Ray Reed, left, and Joe DeMeyer.

RICHLAND, WASH.—The first plutonium-aluminum alloy rods were introduced into the Hanford atomic reservation's spanking new Plutonium Fuels Pilot Plant recently, marking an important milestone in Hanford's Plutonium Recycle Program. Fuel elements will be fabricated in the new facility for the Plutonium Recycle Test Reactor, which is expected to start operation in mid-1960. The Hanford plant is operated by General Electric for the Atomic Energy Commission.

Working toward peaceful applications of the atom, the recycle program will determine the feasibility of reclaiming plutonium that has been produced in uranium fueled reactors and using it as an enrichment fuel for power reactors.

C & C Welding Supply Weld-O-Rama May 25-26

SALT LAKE CITY—The latest methods of joining and severing metals will be demonstrated by factory representatives from Linde Co., Div. of Union Carbide Corp., Lincoln Electric, Black and Decker, Bay State Abrasives, Handy and Harmon and the Stookey Co. C & C Welding Supply Co. is hosting the Weld-O-Rama, May 25-26, in its welding service center here at 999 So. Redwood Rd.

Tool Components New Rep for Lodding Line

LOS ANGELES—Tool Components, Inc., at 12923 Budlong, Gardena, Calif., has been appointed Southern California distributor of Lodding Jig and Fixture Hardware. Tool Components is a supplier of aluminum and specialty tooling products.

PAYLOADER® handling system



easily adjusts to plant changes

IN SYRACUSE, N.Y., on the same site where they built America's first soda ash works about 80 years ago, Solvay Process Division, Allied Chemical Corporation today operates one of the world's most modern alkali manufacturing installations. This progressive firm maintains an active modernization and plant expansion program . . . relies on the flexibility of "PAYLOADER" tractor-shovels to handle the required volume of raw materials without interruption.

SEVERAL SIZES of "PAYLOADER" units are used in various Solvay plants today: a 5,000-lb. operating capacity model is used by the firm's construction division; 3,000-lb. capacity Model HAH's with extra long reach convey sodium chloride from stockpiles to elevator hoppers; and, speedy new 2,500-lb. operating capacity H-25's (shown) are used to transport in-process material to floor chutes.

THESE "PAYLOADER" UNITS provide the most flexible bulk material handling system that can be installed in any plant. Without special or expensive installation of fixtures, they load themselves anywhere . . . travel any path (around corners, through narrow aisles and doorways, up and down ramps) with speed and safety . . . deliver and unload themselves any place . . . all with a one-man operator in the driver's seat.

A HOUGH DISTRIBUTOR near you will be glad to demonstrate how a "PAYLOADER" system can solve your bulk handling problems by reducing costs, increasing output. Return the coupon today for more facts.

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*... the two-way answer
to assembly problems!*



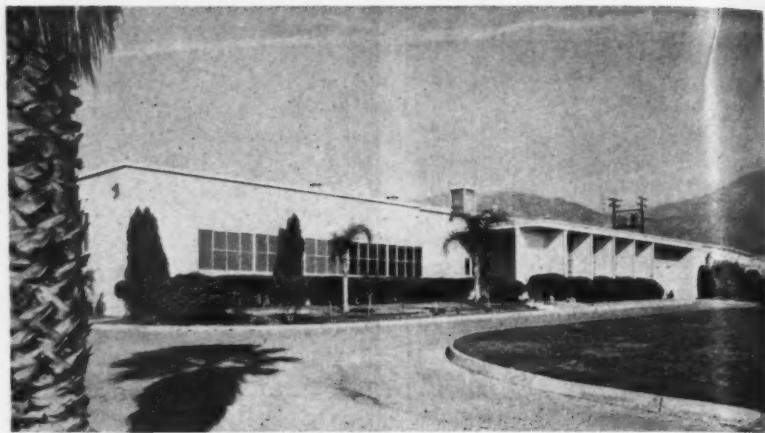
Here's a combination that cuts production costs and gets rid of assembly problems in a hurry—Milford Tubular Rivets made to high quality standards to assure a better finished product for you... Milford automatic rivet-setting machines that can be quickly adapted to your particular fastening needs. Write for more information on how you can put this team to work.



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Hitemp Establishes Plant at New Monrovia



NEW MONROVIA, CALIF. — Hitemp Wires, Inc., a Westbury, N. Y. firm, officially opened Hitemp, Inc. here last month as a newly formed and wholly owned subsidiary of the company.

George F. Rolfe, president of Hitemp Wires, a producer of high temperature wires, cables and cable assemblies, said the West Coast move

became necessary when the company's Westbury facilities had difficulty in meeting increased demands from Western companies.

He said the new plant represents an investment of approximately \$250,000 and contains enough space and provisions for ultimately increasing the company's over-all production by 50%.

New Wagner Bag Div. Plant in Operation

SALT LAKE CITY—Wagner Bag Div., St. Regis Paper Co., marked formal operations recently at its new multi-million dollar plant at 257 South 8th West.

The 140,000 sq. ft. facility makes textile bags as well as cotton and burlap sacks in addition to multi-wall and other paper bags.

I. J. Wagner, president, and *Abe Wagner*, vice president of Wagner Div., are sons of the founders.

When in full operation, production can be 200,000 multi-wall bags a day and 300,000 textile bags, according to *Hugh W. Sloan*, New York, vice president of St. Regis Paper Co.

Victor Equipment Co. Acquires L&B Welding

SAN FRANCISCO—The Victor Equipment Co. here has announced acquisition of the L&B Welding Equipment, Inc., of Berkeley, Calif. L&B manufactures machines for rebuilding tractor track parts.

The acquired company will operate as a wholly owned subsidiary. *Turner G. Brashier, Jr.*, president of L&B and other L&B executives will be retained in their current positions, according to the Victor announcement.

Bethlehem Installs New Roll Threading Machine

SAN FRANCISCO—New equipment installed in Bethlehem's South San Francisco Bolt and Nut Dept. makes it possible for this plant to supply a full range of threaded rods from $\frac{1}{4}$ to 2-inches in diameter.

The new roll threader is capable of handling rods from $\frac{1}{4}$ to $\frac{5}{8}$ -inches in diameter in any length and up to 4-inches in threaded length. It supplements an existing machine which covers the $\frac{1}{2}$ to 2-inch range of threading.

The new machine has a capacity of 40 rods per minute.

Cleveland Firm Acquires Shockley Transistor Corp.

PALO ALTO, CALIF.—Acquisition of the assets of the Shockley Transistor Corp., here, a subsidiary of Beckman Instruments, Inc., by Clevite Corp., Cleveland, Ohio, was announced recently by Beckman and Clevite.

William G. Laffer, Clevite president, said the acquisition will materially augment the company's activities in the semiconductor component field. The Shockley unit, headed by Nobel prize-winning physicist, *Dr. William Shockley*, will become part of Clevite's Transistor Product Div. which headquarters in Waltham, Mass.

New Headquarters For Easterday Supply

PORLAND—The local office of Easterday Supply Co. recently moved into its new building on 1326 N.E. 63rd Ave., it was announced by *Marcel Bobillot*, manager.

Occupying 20,000 sq. ft. on a single level, the new building houses both general offices and warehouse for the northwest headquarters of Easterday Supply Co., a supplier of janitorial materials.

The display room features a special flooring of various materials which can be used for testing products and is designed to show the latest in janitorial products.

This marks Easterday's second move within five years, a result of continual expansion in the Northwest market. The Portland Easterday office began in 1943 when the company purchased the J. N. Allen Supply Co. The number of people on the payroll has tripled in that time.

Easterday has 12 offices serving the Western states with principle offices in San Francisco and Los Angeles.

Inspect Honolulu Steel Service Center



Honolulu — Herbert Ziegler (right), president, Ziegler Steel Service Corp. and Lee H. Burke, Honolulu Division manager, inspect stock at the firm's newest steel service center, the Honolulu Division. Opened last fall, the center is designed to serve Hawaii's rapidly expanding construction industry.

Snap-Tite Creates Western Division

ENCINO, CALIF.—*Tom Welsh* has been named sales manager of the new Western sales division of Snap-Tite, Inc., of Union City, Pa., producer of valved couplings.

Western division headquarters are located at 1611 Ventura Blvd., here.

Ducommun and McCormick Steel Contemplate Merger

LOS ANGELES—It was announced jointly recently by *Charles E. Ducommun*, president of Ducommun Metals & Supply Co., here, and *Robert K. Moses*, president of McCormick Steel Co., Houston, that the boards of directors of their respective companies have authorized their managements to discuss the possibilities of combining the two organizations.

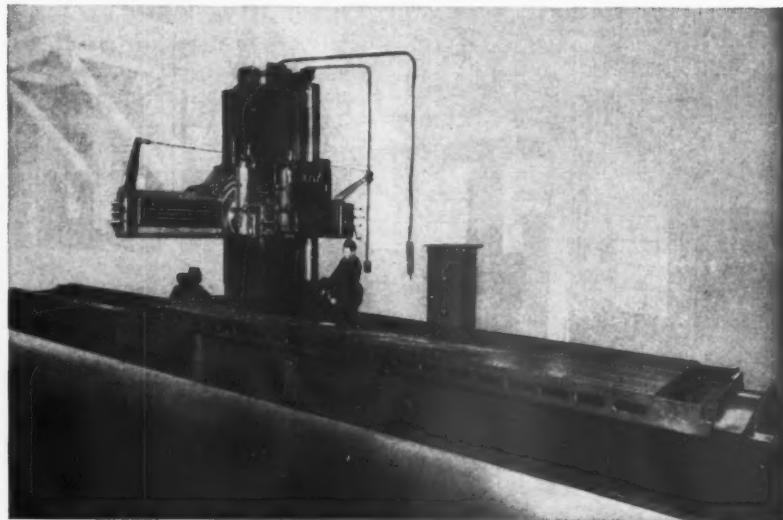
McCormick is a 15 year old steel warehousing chain with 1959 sales of about \$8,000,000, and earnings of \$513,000. It has sales and service centers throughout the Southwest. It is contemplated that McCormick will continue its own name and will operate under the direction of its present management as a wholly-owned subsidiary of Ducommun.

Ducommun was founded here in 1849 and sells steel, aluminum, brass, copper and industrial supplies. It operates plants throughout the Western states. Its 1959 sales volume was more than \$58,000,000, and profits were \$2,007,000. Total assets of the two companies, if combined, will approximate \$30,000,000.

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Giant Planer Cuts Machining Cost

Cut costs! Speed production! Moore does both with a heavy duty openside planer. It's part of the all-inclusive machining facilities at Moore which emphasize use of special and heavy duty tools, such as large vertical and horizontal boring mills, lathes, grinders, and many others. Let your machining job benefit from Moore's 50 years of experience. Consult Moore...for one-stop, one-shop machining requirements.



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At the controls of P&H Harnischfeger WNG 200 portable welder is E. D. Schwal, Denver, Colo., branch sales manager. Unit pulls 40 to 250 amps, can be trailer or skid mounted.



Warren A. Mundy, Bay State Abrasive Products Co., prepares weldment with reinforced Resinoid abrasive wheel. Raised hub Saf-T-Cut "BZ" disc wheels cut fast under harsh grinding conditions.

Exhibits, Demonstrations and Technical Program at Los Angeles Welding Show



A demonstration of the Model "E" Heliweld Automatic welding head is carried on by Air-Co (AIRCO) sales engineer Bill Pierce. Device is designed for applications where long-run regular or irregular production contours are involved.

LOS ANGELES—What was claimed to be the largest and most valuable collection of welding equipment ever assembled at one time went on display late last month at the 41st Annual Convention and Welding Show of the American Welding Society here.

The dual program featured exhibits at the Great Western Exhibit Center and five days of technical sessions at the Los Angeles Biltmore Hotel.

The latest in welding equipment and scores of demonstrations greeted Exhibit Center visitors. A number of products made their debut at the show.

Running concurrently with exhibits was the technical program that offered 69 papers, dozens of panel sessions and welding symposiums to welding industry representatives. Subject matter ranged from a fracture mechanics symposium to practical methods of welding pipe.

During the five-day convention, R. D. Thomas, Jr., president of the Arcos Corp., was elected president of the AWS and was officially presented to the membership. Re-elected vice-president was A. F. Chouinard, director of R&D, National Cylinder Gas.



AT RIGHT: Welding engineers staffing Linde booth give on-the-spot advice to visitors on full variety of welding problems. Linde staged continuous demonstrations.

New Scale Facilities For Fairbanks, Morse

SAN FRANCISCO—Fairbanks, Morse & Co. has announced completion of negotiations with Gilmore Steel Corp. for fabricating facilities at 1401 Middle Harbor Rd., Oakland, Calif., for the manufacture of fabricated all steel scales for industry and agriculture.

Fairbanks, Morse & Co. will engage in the complete manufacturing of weighing equipment under the direction of *Clyde Marion*, a pioneer in development and design of this type of scale equipment. Marion will head-quarter in San Francisco.

The main building for the manufacturing of scales is approximately 25,000 sq. ft. and is complete with required machinery. *R. T. Bartlett* will serve as chief engineer of the operation. Research and development of the fabricated line of scales will be conducted in the Oakland plant.

Developed under the direction of *Roger M. Murray*, vice president and Western regional manager, the new manufacturing facility will be under the direct supervision of *F. C. Johnson*, vice president and general manager of the Scale Div., Fair Lawn, N. J.

King Anodizing Appointed Kaiser Process Licensee

BURBANK, CALIF.—King Anodizing, 2905 Winona Ave., here, has been licensed by Kaiser Aluminum to use their recently developed Kalcolor anodizing process, according to *F. A. Loebach*, architectural sales manager of Kaiser Aluminum & Chemical Sales, Inc.

Formed in 1956 as a partnership, King Anodizing specializes exclusively in architectural finishing for the construction industry. Its plant here currently occupies 110,000 sq. ft.

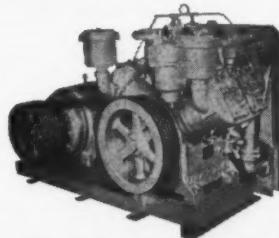
The Kalcolor process, developed by Kaiser Aluminum's Dept. of Metallurgical Research, Spokane, Wash., has been under test for more than four years. Through the process a superior anodic coating is given architectural aluminum in a broad variety of colors, and an exceptionally high degree of color stability and uniformity. The process and resulting colored, oxide-coated aluminum product are covered by Kaiser Aluminum patent rights.

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... for more details, circle No. 58 on Reader Service Postcard

Boise Cascade Container Buys Sunnyvale Site

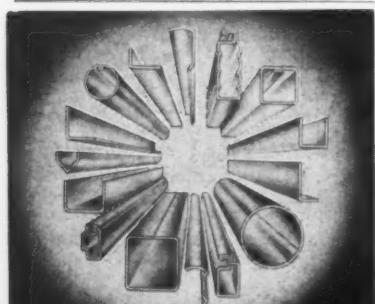
BOISE, IDA.—The Boise Cascade Container Corp. has announced the purchase of 17 acres in Sunnyvale, Calif., upon which a multi-million dollar corrugated container plant will be built.

Earlier Boise Cascade acquired the corrugated division of Schmidt Lithograph Co. It plans to relocate the entire plant on the newly acquired Sunnyvale site.

Budd Co. Acquires Metrol of Pasadena

PASADENA, CALIF.—The Budd Co. has acquired the assets of Metrol Inc., local manufacturers of electromagnetic non-destructive testing equipment. In announcing the move, Dr. John H. Buck, vice president and general manager of the Instruments Div. of Budd, said the purpose of the acquisition is to expand the division's non-destructive testing equipment line.

Metrol will operate for the present as a new department of the Budd Instrument Div., with Richard Hochschild, Metrol president, joining the Budd Co. on a full time basis.



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78

Rocket Power / Talco Dedicated



New Rocket Power/Talco 50,000 sq. ft. solid propellant facility near Mesa, Ariz. Building at left houses preparational and finishing operations. The more hazardous mixing, curing and loading operations are located in the heavily barricaded structure on the right. In the background is Rocket Power's new 7,000 sq. ft. engineering building.

PHOENIX—Rocket Power Talco, a division of the Gabriel Co., Ohio, opened its doors to a group of Gabriel Co. staff, to the armed forces and representatives from the numerous prime contractors in the southwest, in dedication ceremonies of the opening of the facility here.

Located on Falcon Field, the facility is of concrete structure for preparational and finishing operations and for mixing, curing and loading operations. The facility is the most recent to be designed exclusively for solid propellant production and loading.

The facility is largely automated for production efficiency, including remote control apparatus. Safety barricades separate each operation; the plant is rated among the safest in operation.

The firm also operates a research center in Pasadena, Calif., where research in high-energy propulsion is conducted.

Established early in 1959 as a wholly-owned subsidiary of the Gabriel Co., Rocket Power was consolidated with the Talco Engineering Co. last fall as a unified division.

Systron and Donner Electronics Merger

CONCORD, CALIF.—The merger of Systron Corp. and Donner Scientific Co., both local electronics companies, has been announced. In the transaction Systron acquired Donner as a wholly owned subsidiary.

Renamed Systron-Donner Corp., G. H. Bruns, Jr., former president of Systron, will serve as president and chief executive officer.

At the present time Systron-Donner provides over 35,000 sq. ft. of plant space, \$5,000,000 annual sales, and employs 340 people representing an annual payroll of approximately \$1,500,000.

In addition to development work for military electronics, both companies are active in non-military markets. Systron designs and manufactures highly specialized equipment for industrial data processing.

Magnetic Amplifiers, Inc. Becomes Siegler Division

LOS ANGELES—Merger of Magnetic Amplifiers, Inc., of New York City into the Siegler Corp. here has been completed, with the approval of Magnetic Amplifiers shareholders and the boards of directors of both companies, it was announced recently.

The joint announcement was made by John G. Brooks, Siegler president, and Harold A. Goldsmith, president, and Herbert Herz, executive vice president, of Magnetic Amplifiers. The latter company produces equipment utilizing solid state devices.

Magnetic Amplifiers, which will become a division of Siegler, operates plant facilities in New York City and in El Segundo, Calif. Founded in 1950, the firm has grown in sales volume to more than \$3,000,000 for 1959 and employs approximately 200 persons at its two facilities.

Truck Equipment Buys Ajax Iron Facilities

DENVER—Edward V. Garnett, president of Truck Equipment Co., has announced his company's purchase of a major interest in the Ajax Iron Works, 1709 Blake St., here.

Ajax is a 50-year-old Denver firm specializing in steel fabrication. It has served the Rocky Mountain region since 1909 in machine shop, shaping, forming, welding and fabricating. Under the new purchase, additional equipment will be added to modernize the plant, especially a new chrome plating tank 3x3x28 ft. capable of handling extra long shafts and axles.

Truck Equipment Co., or Truco-Denver as it is known internationally, manufactures truck-mounted derricks, aerial ladders and lifts, tensioning and cable reel trailers for the public utilities and railroads.

Perch Opens Idaho Branch

WEISER, IDAHO—The local branch of the I. B. Perch Mfg. Co., California builders of 12-foot trailers for campers and sportsmen, began operations here recently with a crew of five.

Perry Kilsby, Inc. Makes Name Change

LOS ANGELES—Perry Kilsby, Inc., distributor of steel and aluminum tubing and pipe, has announced a corporate name change to Kilsby-Tubesupply. President R. Perry Kilsby explained that the new name was chosen to describe the company's primary function.

Kilsby-Tubesupply has Western offices in Los Angeles, San Diego, San Francisco, and Seattle, with sales representatives in Salt Lake City, Denver, Phoenix, and Albuquerque, New Mex.

To Build \$3 Million Gypsum Board Plant

CODY, WYO.—Sid H. Elison, president of the Big Horn Gypsum Co., has announced construction will start as soon as weather permits on the \$3,000,000 gypsum board plant. Ground was broken March 14.

The plant will employ some 125 men and will produce about 100 million feet of gypsum board annually to be distributed in 10 states. About 25 carloads of raw materials from a deposit 4.5 miles south of here will be used daily, Elison added.

United Control Corp. Building at Seattle

SEATTLE—Officers of United Control Corp. have signed a contract with Cawdrey & Vemo, Inc., general contractors, for the construction of a combined engineering and production facility on a 30-acre site in Overlake Industrial Park, east of Seattle.

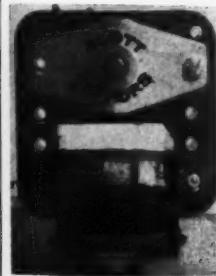
The building will be 136,000 sq. ft. in area. Under the terms of the contract, the cost of the structure will not exceed \$1,676,000. The contract provides incentive provisions if construction costs are below the fixed maximum.

Louis P. Hanson, president, said the new electronics plant expects completion by February, 1961. The company presently employs 845 and employment is expected to be about 1,000 persons when the plant is completed.

2,000 Foot Extension At El Rio Oil Field

VENTURA, CALIF.—Discovery of a 2000 foot eastern extension of California's El Rio oil field near Ventura was announced recently by Standard Oil Co. of California, Western Operations, Inc.

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Plant
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● PRODUCTIVITY

— Plus —

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— and —

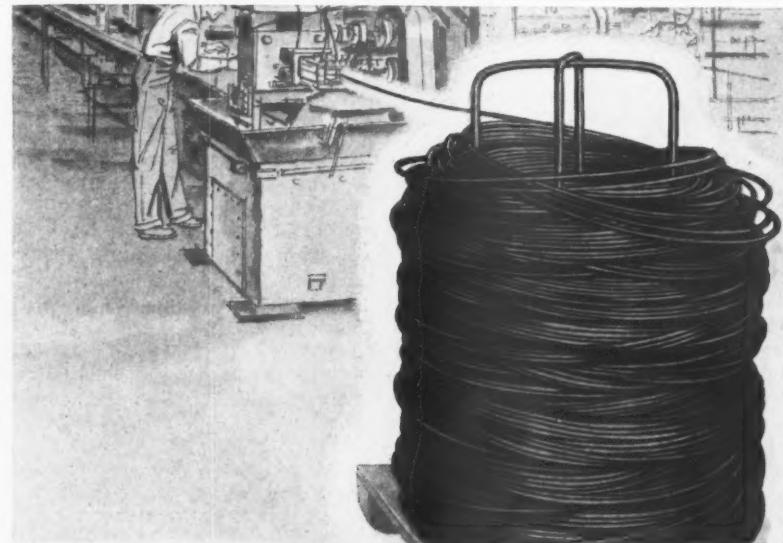
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WESTERN INDUSTRY/MAY 1960



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Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

7668-8

... for more details, circle No. 61 on Reader Service Postcard



westerners at work

■ *Darwin W. Mark* has been named technical director, Nash-Hammond, Inc., El Monte, Calif.

■ *Harry Wetzel, Jr.*, is newly appointed supervising vice president for five of Garrett Corp.'s divisions, Los Angeles.

■ *F. P. Newman* is newly named manager of production and distribution for Air Reduction Pacific Co., San Francisco.

■ *H. W. Christensen* retires after 40 years with U. S. Steel's Columbia-Geneva Div., director of purchases, San Francisco.

■ *William L. Nehrenz* has been elected vice president of Eldon Industries Inc. and will continue as general manager of Ungar Electric Tools, a div. of Eldon.

■ *Cecil Baltzegar* has been named manager of newly created market research dept. at Omark Industries, Portland.

■ *Henry J. Noebels*, Scientific and Process Instruments Div., Beckman Instruments, Inc., will be a U. S. delegate to Int'l. Federation of Automatic Control meeting in Moscow June 27.

■ *Gene M. Prioli* is newly named assistant supt., Electric Furnace Dept., Bethlehem Steel Co.'s Pacific Coast



D. W. Mark
Nash-Hammond



Harry Wetzel Jr.
Garrett Corp.



F. P. Newman
Air Reduction



H. W. Christensen
U.S. Steel



Wm. Nehrenz
Eldon Ind.



C. Baltzegar
Omark Ind.



H. J. Noebels
Beckman



Gene Prioli
Bethlehem

Div., Los Angeles.

■ *Dr. Marvin Fox* has joined Hughes Aircraft Co.'s nuclear electronics laboratory as a senior staff physicist.

■ *Noah Dietrich* has been elected to the board of directors of Transval Electronics Corp., El Segundo, Calif.

■ *Lloyd F. Bielenberg* has been named assistant treas. of Eitel-McCullough, Inc., San Carlos, Calif.

■ *Clinton Eastwood* is new general sales manager of Container Corp. of America, Corrugated Shipping Container Div., at San Francisco.

■ *Franklin H. Hunsicker* has been appointed manager of Continental Can's metal can plant in Pittsburg, Calif.

■ *John D. Bloom* has joined United Control Corp., Seattle, in a sales capacity.

■ *John M. Jurist* has been promoted to West Coast dist. manager "POP" Rivet Div., United Shoe Machinery Corp.

■ *Robert L. Thomas*, the first president of the Los Angeles chapter of the American Materials Handling Society, passed away recently.

■ *Robert B. MacKenzie* has been appointed director of marketing, Sierra-Schroeder Controls Div., Idaho Maryland Mines Corp., Glendale, Calif.

■ *William G. Vance* has been appointed marketing director, telephone equipment program, Siegler Corp.'s Hallamore Electronics Div. at Los Angeles.

■ *Walter J. Blair* has been named vertical pump product sales manager, Peerless Pump, Hydrodynamics Div., Food Machinery and Chemical Corp., Los Angeles.

■ *Roy W. Johnson* has been appointed manager contract sales for Keenan Pipe & Supply Co., Los Angeles.

■ *Richard A. Roosevelt*, Los Angeles, is new West Coast rep for Industrial Div. of Daffin Mfg. Co.

■ *Leo M. Chatter* is new general manager of Raymond Atchley, Inc., Los Angeles, a sub. of American Brake Shoe Co.

■ *Larry R. Madden* has been named a West Coast senior sales rep for Industrial bulb sales, Corning Glass Works at San Francisco.

■ *Frank Genochio* has been promoted to vice pres. in charge of sales for Kaar Engineering Corp., Palo Alto.

■ *William T. Eccles*, vice pres. and treas., McMurtry Mfg. Co., Denver, has retired after 40 years of service.

■ *J. Stanley Mitchell* has been named mill superintendent of Southwest Potash Corp., Carlsbad, N. M.



R. C. Schofield
Johns-Manville



J. I. Beicher
Clark Equipment



Arnold Antola
Robt. Braun



D. E. Schurman
J. T. Ryerson



F. P. Trinkaus
Crellin Machine



Myron Oakes
Byron Jackson



W. E. Weber
A. M. Byers



Paul Pease
Republic Supply

div., Taylor Fibre Co. at La Verne, Calif.

■ *George W. Aljian*, vice pres. C and H Sugar Refining Corp., San Francisco, retires after 40 years of service.

■ *Dr. Louis Zitelli* is new manager, Klystron Development at Varian Associates, Palo Alto, Calif.

■ *Donald L. Hess* has been transferred to the Southern California sales staff of Titan Metal Mfg. Co., a div. Cerro de Pasco Corp., Los Angeles.

■ *Dr. Irving S. Bengelsdorf* is new senior scientist for U. S. Borax Research Corp., a sub. of U. S. Borax & Chemical Corp., Anaheim, Calif.

■ *Paul K. Martin* has been named manager of the Seattle metal can plant of Continental Can Co.

■ *Charles R. Clark*, Tidewater Oil Co. marketing executive, San Francisco, is retiring after 40 years of service.

■ *John S. Sneed* has been named purchasing agent, Waste King Corp., Los Angeles.

■ *L. L. Scott* has been appointed sales engineer, Western Backing Corp., Culver City, Calif.

■ *James G. Baldwin* has joined Hooker Chemical Corp. in new position of general manager, Western Chemical Div., Tacoma, Wash.

■ *Stephen Bianco* and *A. B. Kreider* have been appointed metallurgical engineer and assistant, respectively, of Bethlehem Steel Co. at San Francisco.

■ *S. E. Danyow* is newly appointed vice pres., rocket and ballistic operations, Rocket Power-Talco Div., Gabriel Co., Mesa, Ariz.

■ *Walter Whitson* has been promoted at Los Angeles to Western regional sales manager, Parker-Kalon, a div. of General Am. Transportation Corp.

■ *J. Y. Robertson* has been appointed general sales office supervisor, Pacific Div. of DeSoto Chemical Coatings, Inc., Berkeley, Calif.

■ *Edward Estrin* has been elected vice-president, manufacturing, of Western Insulated Wire at Los Angeles.

■ *Earl R. Peterson* is new Western Div. sales manager Taylor Fibre Co.

■ *Richard C. Schofield* will direct sales for Johns-Manville, glass textile section, in Southern California and Arizona.

■ *J. I. Beicher* has been appointed Western regional manager, Clark Equipment Co., San Francisco.

■ *Arnold Antola* has been named sales manager, Robert H. Braun Co., Los Angeles.

■ *Dwight E. Schurman* is new general supt. of Seattle steel and aluminum service plant of Joseph T. Ryerson & Son.

■ *Francis P. Trinkaus*, president of Crellin Machine Co., Los Angeles, was honored recently by National Screw Machine Products Association.

■ *Myron D. Oakes* is newly named manager, Product Development Section, engineering dept., Byron Jackson Pumps, Inc., Borg-Warner subsidiary at Los Angeles.

■ *W. E. Weber* replaces *Albert D. Sheere* who retired as manager, Pacific Coast Div., A. M. Byers Co., San Francisco, after 36 years with the firm.

■ *Paul L. Pease* fills post of newly created vice president, finance, Republic Supply Co. of Calif., Los Angeles.

■ *J. W. Hinchliffe* is newly named director of subcontract marketing for Northrop Corp.'s Norair Div., Hawthorne, Calif.

■ *Anthony J. Schmidt*, Oakland, Calif., is the new Comptroller of the San Francisco Ordnance District.

■ *David M. Conrad* has been named manager of Administration for Space Technology Operations, Aeronutronic, div. Ford Motor Co., Newport Beach, Calif.

■ *O. C. Madsen* has been named Division Comptroller, Utah Copper Div., Kennecott Copper Corp.

■ *R. P. McAlister*, sales manager of Leach Corp. Relay Div., has been elected secretary Nat'l. Assoc. of Relay Manufacturers.

■ *Richard F. Horak* has been appointed manager of new Pacific Scientific Co. sales office at Denver.

■ *W. C. Henderson* has been named manager utility sales, and *A. W. Leighton*, manager industrial sales, Allis-Chalmers Industries Group, Los Angeles.

■ *David W. Miller* has been named district sales rep of Calif., Oregon and Washington for Greene, Tweed & Co.

■ *Edward J. Guelpa* has been appointed general manager of Western

Contract News in the West

LOS ANGELES—U. S. Army Ordnance District with headquarters at 55 S. Grand Ave., Pasadena, announced contracts totaling over \$10,000,000 on March 25 and April 1.

The Rocketdyne Div. of *North American Aviation, Inc.*, Canoga Park, Calif. received the largest contract, \$4,672,647 for classified research and development.

Consolidated Western Steel Div., *U. S. Steel Corp.*, Los Angeles, a \$1,630,624 contract for Little John missile motor cases and miscellaneous hardware and \$231,541 for design, development, fabrication and testing of Little John missile motor case assemblies.

Douglas Aircraft Co., Inc., Santa Monica, \$1,331,725 for Nike missile repair parts and \$54,056 for Nike Hercules launching area items.

Aerojet General Corp., Downey, Calif., \$488,944 for research and development for cartridges and \$50,832 for classified research and development.

Radioplane, a Div. of *Northrop Corp.*, Van Nuys, Calif., \$325,437 for target missile flight services.

Ryan Aeronautical Co., San Diego, \$200,000 for research and development for a target missile flight service program.

Cubic Corp., San Diego, \$135,640 for research and development for fabrication, installation and checkout of electronic trajectory measuring system.

Firestone Tire & Rubber Co., Los Angeles, \$105,450 for Corporal missile repair parts and a \$45,000 contract for Corporal guided missile system.

Harvey Aluminum, Torrance, Calif., \$80,000 research and development for cartridges and \$52,492 research and development for demolition kits.

California Computer Products, Downey, \$48,257 research and development of battery display units.

Eidal Mfg. Co., Albuquerque, N. M., \$48,076 for trailer spare parts.

Endevco Corp., Pasadena, Calif., \$45,000 research and development for accelerometers.

Motorola, Inc., Scottsdale, Ariz., \$33,266 for transponders.

Engineered Magnetics, Hawthorne, Calif., \$30,000 research and development for converters and *Servomechanisms, Inc.*, Hawthorne, \$25,000 for development of control system.

The Dept. of the Navy, Bureau of Naval Weapons on April 20 awarded a \$600,000 contract to *Packard Bell Corp.*, Los Angeles, for the production of a target detecting device for the Terrier guided missile.

The Navy's Special Projects Office awarded an additional contract in excess of \$1,000,000 to *Interstate Electronics Corp.*, Anaheim, Calif., for an additional set of instrumentation for the Polaris Weapons System Evaluation.

Mullenbach Div. of *Electric Machinery Mfg. Co.*, Los Angeles, reports filling a director contract with the Corps of Engineers for new units needed for the Nike Zeuss program. The order totaled in excess of \$100,000.

Transval Electronics Corp., El Segundo, Calif., received a \$1,386,000 contract from Headquarters, U. S. Army Transportation Corps, St. Louis, Mo., for the manufacture of six electronically-equipped amphibious vehicles.

Among follow-on orders: *North American's Rocketdyne Div.* awarded *Lear, Inc.*, a contract in excess of \$1,000,000 to manufacture universal components test stands for ICBM rocket engines.

C. F. Braun & Co., Alhambra, Calif., for construction of Experimental Organic Cooled Reactor (ECOR) at the National Reactor Testing Station in Idaho. A cost-plus-fixed-fee contract was negotiated with the firm. *Fluor Corp., Ltd.*, Los Angeles, is performing the architect-engineering service for ECOR. *Atomics International*, a div. of North American Aviation, Inc., Canoga Park, Calif., as subcontractor to Fluor, is providing nuclear assistance in the design of the facility. *Phillips Petroleum Co.*, Idaho Falls, performed the conceptual design for the reactor. Estimated cost of construction for the ECOR is \$4,000,000.

The Atomic Energy Commission, Idaho Falls, Idaho, announced the following contract awards:

Three contracts, totaling \$175,000 have been awarded to the *J. C. Carter Co.*, Costa Mesa, Calif., for supplying all fuel and cryogenic pumps for Titan missile sites.

The Los Angeles Div. of *Servomechanisms, Inc.*, received \$309,343 in production orders from Lockheed Aircraft for production of True Airspeed Computers and new contracts totaling more than \$100,000 were awarded *Trans Electronics, Inc.*, Canoga Park, Calif., a subsidiary of Burton Mfg. Co., Santa Monica, for a group of high voltage low power and high current low voltage power supplies which will be used in high speed printers.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are $\frac{1}{8}$ inch short of contracted space to allow for borders and composition. Rates are \$16.00 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 25th if no proofs are required.



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The impact of a personal typewritten letter is well known, but heretofore these letters in large quantities have been impractical to produce. Now MAILWAYS INC. through use of tape, can volume process your letters ... effectively and economically.

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*also quality printing & engraving

Pennsalt To Lease Wallula Facility

WALLA WALLA, WASH.—Building of a \$160,000 chemical distribution facility on Port of Walla Walla property, Wallula, is underway for the port district. The port will lease the structure to Pennsalt Chemicals Corp. The initial unit will occupy about three acres but the company has taken an option on 40 adjacent acres.

Chemicals manufactured in Portland will be brought up the Columbia river by special barges and distributed from the new Wallula center storage tanks by rail and truck throughout Washington, Oregon, Montana and Idaho. The main chemicals will be caustic soda and chlorine, used largely in the pulp and paper industries.

The barges will eventually be equipped with tracks so that railroad tank cars can be loaded on the barges, the tank cars then will be brought ashore on special tracks and shipment can be made over the railroads without transfer of the load.

First phase of the distribution center is expected to be completed by July 1.

Varian To Acquire Semicon Associates

PALO ALTO, CALIF.—The forthcoming acquisition of Semicon Associates, Inc., by Varian Associates has been announced by the managements of the two electronics firms. Varian will acquire 100 per cent ownership of Semicon through an exchange of common stock.

Semicon, which was founded in 1953 by Dr. Otto G. Koppius, is of special interest to Varian Associates, according to Dr. E. L. Gintzon, chairman of the Varian board, because of its strong position in the field of dispenser cathodes which are of increasing importance to microwave technology.

Crane Pacific Plans Warehouse Expansion

COLTON, CALIF.—Plans for expansion of storage and warehouse facilities at Crane Pacific, 330 West Citrust St., a bathroom fixture manufacturing plant here, were disclosed recently.

The expansion calls for a new 24,000 sq. ft. building, which covers over one-half acre, to be built near Laurel St. at the present location of the plant. Completion is expected by August.

Garrett Freightlines May Acquire Inland

POCATELLO, IDAHO—An Interstate Commerce Commission Examiner recently recommended approval of transactions whereby Garrett Freightlines, Inc., here, would acquire and merge Inland Motor Freight of Spokane and a string of the latter's subsidiaries.

Approval was also recommended of transactions whereby Garrett would acquire and merge Northwest Freight Lines, Inc., Billings, Mont., and a string of Northwest's subsidiaries.

The Inland subsidiaries involved include: Inland Pacific Service Co., Inland Terminals, Inc., Pacific Highway Transport Inc., Pacific Auto Transfer, Inc., and Pacific Highway Transport, Inc., of Oregon.

In taking over Northwest Freight Lines, Garrett would also acquire: Northwest Terminals, Inc., Freight Terminals, Inc., and Flathead Transportation Co., Inc.

Colorado Pump & Supply Build New Facilities

DENVER—A new air-conditioned brick building at 560 South Lipan, here, is scheduled for completion this month, according to President J. L. Manning of the Colorado Pump & Supply Co. The new facilities will house the company's sales and warehousing operations.

The 12,000 sq. ft. structure is located on a 28,000 sq. ft. site of which 3,000 sq. ft. will be utilized for business and sales offices, devoting the remainder to warehousing. The entire building is dock height, with convenient railcar loading facilities and dock facing onto a Colorado & Southern Railway spur track, and two truck loading docks.

Colorado Pump & Supply is a regional distributor of pumps, machinery and industrial supplies.

Name New Weyerhaeuser Panel Products Reps

TACOMA, WASH.—Recently appointed panel products distributors for the Silvatek Div. of Weyerhaeuser include five Western organizations.

They are: Harbor Plywood Corp., Oakland, Calif.; Harbor Plywood Corp., San Francisco; Al Disdero Lumber Co., Portland; Modern Materials, Inc., Los Angeles; and Chandler Supply Co., Inc., Boise, Idaho.

NEW PRODUCTS

PNEUMATIC STRETCHER



Model 651—Featuring adjustable controlled tension. Tool takes various size strapping . . . operates well on small surface. Write: A. J. Gerrard, 420 East Touhy Avenue, DesPlaines, Illinois. . . for more details, circle No. 62

PNEUMATIC SEALER

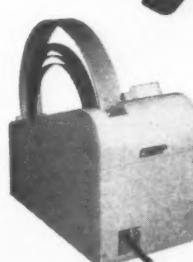


Models 660 & 661—New effortless double crimp pneumatic sealer provides faster, positive sealing action. Write: A. J. Gerrard, 420 East Touhy Avenue, DesPlaines, Illinois. . . for more details, circle No. 63

STRAP CUTTER

Model 550—Cuts strap to 2" x .050 with less effort. Legs on lower handle provide extra stability. Long handles give greater operator safety. Write: A. J. Gerrard, 420 East Touhy Avenue, DesPlaines, Illinois.

. . . Circle No. 64



DIAL-A-BAND DISPENSER

Model 440—Set the dial and press a button—new dispenser automatically feeds and cuts exact length and number of straps needed. Write: A. J. Gerrard, 420 East Touhy Avenue, DesPlaines, Illinois. . . Circle No. 65

ADVERTISERS INDEX

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Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rod—
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

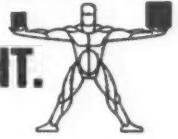
A. P. JOHNSTON CO. INC.
1845 E. 57th St., Los Angeles 58

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WESTERN INDUSTRY/MAY 1960

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YOU CAN  FORM IT,
WELD IT, AND
GET HIGHER STRENGTH....
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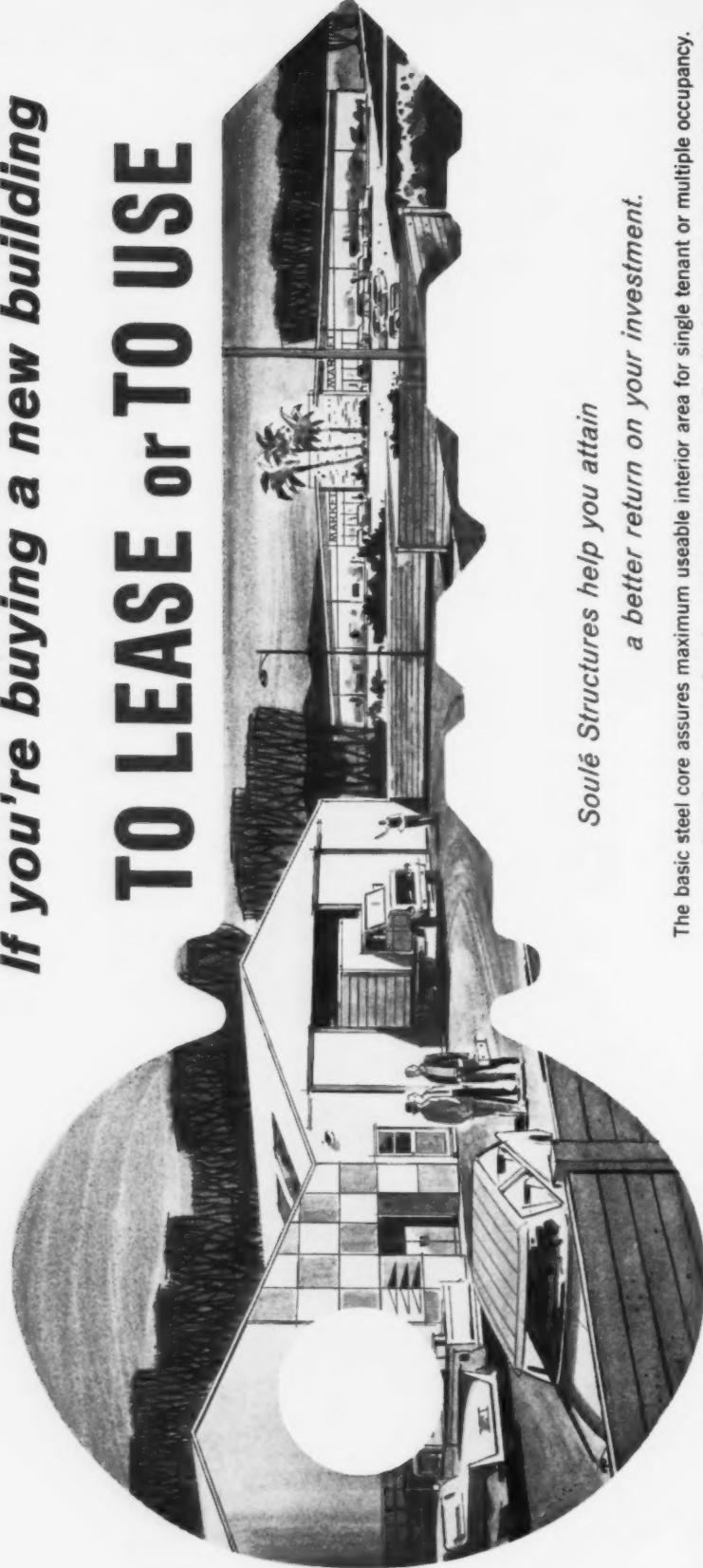
N-A-XTRA 100 is one of the best low-carbon alloy extra strength steels you can buy. Heat treated, fully quenched and tempered, it's now stocked by Ducommun in minimum yield strength of 100,000 PSI. This is nearly three times the strength of ordinary carbon steel. The tensile strength is approximately 120,000 PSI. The great strength and ductility of N-A-XTRA gives engineers and designers a unique opportunity to eliminate bulky, useless dead weight from finished products. Production men will delight in its superior formability, superb weldability, abrasion and atmospheric corrosion resistance. It is tough at normal and subnormal temperatures. N-A-XTRA can be cold formed into difficult shapes, flame cut, sheared, machined, and otherwise handled by conventional fabricating methods. Ducommun stocks N-A-XTRA in thicknesses 1/8, 3/16, 1/4, 3/8, 1/2, 3/4 and 1", size 72" x 240". Send for free, illustrated technical brochure, typical physical and chemical properties and other metallurgical data.

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METALS & SUPPLY CO.

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GRIDLEY 7-3141
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*Soulé Structures help you attain
a better return on your investment.*

The basic steel core assures maximum useable interior area for single tenant or multiple occupancy.

Partitions, special facades and equipment are easily attached to the steel members without costly alterations or mess. When tenants or use change, remodeling is quick and economical.

Soulé Structures go up fast for industrial or commercial use—your investment can start producing income sooner. Before you decide on a site, call Soulé for a planning chat. It will help you get a building that will suit your land, needs and budget.

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